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**Spotlight  
Features  
for '61**

JAN 10 1961

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# CONTRACTORS and ENGINEERS

MAGAZINE OF MODERN CONSTRUCTION

JANUARY 1961



Steam plant Page 70



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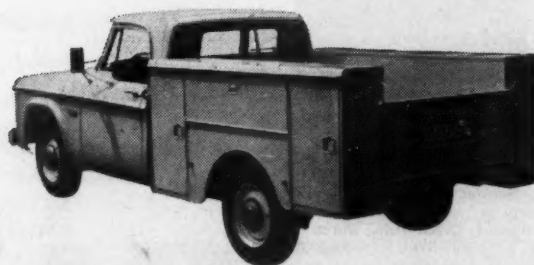
# DART PICKUP

## NEW FROM DODGE FOR '61

### THE FIRST AND ONLY TRUCK WITH

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Compact diet. Compact upkeep costs. Compact in everything but work capacity. A full half-ton hauler that'll do the dirty jobs every day, day in and year out. New right down to the wheel studs. New cab. New body. New and easier clutching, shifting, handling. Even a new soft sound. New Dart Power Six, overhead valve, 225-cubic-inch engine that will actually deliver more miles per gallon than Ford and Chevrolet. That's how our tests worked out. And we wouldn't talk about it if you couldn't get the same results. The engine is slanted 30 degrees from the vertical for top-notch manifolding, both intake and exhaust. **THE '61 DODGE LINE?** All Dodge, all tough from end to end. Conventional and cab forward models, four-wheel drive series, Town Wagons for toting men and tools. Six and V8 gasoline power. Cummins diesels. A weight spread of 4300 lbs. GVW to 76,800 lbs. GCW. **PRICE?** The new Dart Pickup and the whole 1961 Dodge line of trucks are priced to compete with every truck coming or going. What more do you want? See your Dodge dealer now!



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# CONTRACTORS and ENGINEERS

470 Park Avenue South, New York 16, N. Y.

A Bittenheim Publication

January 1961

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Page 12



Stone fill for new piers

Page 80



### COVER:

In a wilderness area near Montana's Flesher Pass road, a Barber-Greene hot-mix plant turns out paving material for improvement of the scenic route. A Cat D7 is feeding the plant, and a GMC truck is loading from the Model 835 continuous mixer. The 7-mile paving contract is being handled by Sweeney & Lustgraaf, Great Falls, Mont.

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### Associated Publications

The American City Overview Mart

Accepted as Controlled Circulation Publication at Lancaster, Pa. Vol. 58, No. 1, \$3 a year, \$1 a copy in the United States and Canada. \$8 a year in other countries. Issued monthly.

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## Next month in *CONTRACTORS and ENGINEERS*

- A new forming method for retaining walls
- Special equipment aids concrete work on dam

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Robert C. Burton

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(add 000 to dollar figures)

	1960	1961	% change		1960	1961	% change		1960	1961	% change
<b>NEW ENGLAND</b>									<b>W.S. CENTRAL</b>		
Maine	19,800	21,000	+ 6%	Mo.	114,000	(114,000)	--	Ark.	41,670	(41,670)	--
N.H.	22,832	27,000	+18%	N. Dak.	27,500	20,200	-27%	La.	96,000	(96,000)	--
Vt.	17,537	21,000	+20%	S. Dak.	48,370	43,000	-11%	Okl.	47,300	(47,300)	--
Mass.	63,000	83,000	+32%	Neb.	43,500	52,000	+20%	Texas	223,000	(223,000)	--
R.I.	10,016	--	--	Kans.	67,000	71,000	+ 6%				
Conn.	44,000	68,000	+55%								
<b>MID. ATLANTIC</b>									<b>MT. MOUNTAIN</b>		
N.Y.	291,860	300,000	+ 3%	SO. ATLANTIC				Mont.	31,195	57,877	+86%
N.J.	68,000	85,000	+25%	Del.	7,534	--	--	Idaho	22,000	28,500	+30%
Pa.	152,000	--	--	Md.	43,789	54,000	+23%	Wyo.	30,515	(30,515)	--
				D.C.	28,400	32,000	+13%	Colo.	42,170	(42,170)	--
				Va.	93,800	120,000	+28%	N. Mex.	30,132	(30,132)	--
				W. Va.	--	--	--	Ariz.	40,000	45,000	+12%
				N.C.	47,000	47,000 <sup>1</sup>	--	Utah	25,000	30,000	+20%
				S.C.	42,000	48,000	+14%	Nev.	14,400	19,500	+35%
				Ga.	80,100	--	--				
				Fla.	88,000	100,000	+14%				
<b>E.N. CENTRAL</b>									<b>PACIFIC</b>		
Ohio	300,000	(300,000)*	--	E.S. CENTRAL				Wash.	75,000	64,000	-15%
Ind.	96,200	98,750	+ 3%	Ky.	71,000	--	--	Ore.	58,555	55,000	- 5%
Ill.	227,747	--	--	Tenn.	78,971	(78,971)	--	Calif.	390,000	370,000	- 5%
Mich.	240,000	250,000	+ 4%	Ala.	87,000	90,000	+ 3%	Alaska	14,000	--	---
Wis.	68,000	96,000	+41%	Miss.	41,000	38,000	- 7%	Hawaii	10,961	16,035	+46%
<b>W.N. CENTRAL</b>											
Mont.	58,687	53,355	- 9%								
Idaho	84,681	85,000	--								

\* figures in parenthesis: state expects awards to "equal or exceed" 1960 level.  
(1) state expects to exceed this minimal estimate.

Source: CONTRACTORS and ENGINEERS Research Department.

## Road contracts to rise in '61

State highway departments plan to let 6 per cent more highway work in 1961 than they did in 1960. This increase comes on top of the very substantial gain in 1960 awards over 1959, which is now estimated at 15 per cent or more for the year.

With road awards increasing again this year, it appears that the momentum the highway program has been gaining in recent months will continue to build up in the months ahead.

This forecast is based on the results of a CONTRACTORS AND ENGINEERS telegraphic survey addressed to the chief engineer or ranking executive officer of each of the 50 state highway departments and the District of Columbia.

According to the states' replies, 1961 contract awards will rise in 23 states and in the District of Columbia; will be at least as high as in 1960 in 11 states; and will fall in seven. Of the 23 states anticipating 1961 increases, 11—Massachusetts, Connecticut, New Jersey, Maryland, Virginia, Wisconsin, Montana, Idaho, Utah, Nevada, and Hawaii—expect gains exceeding 20 per cent. Another six states—New Hampshire, Vermont, South Carolina, Florida, Nebraska, Arizona—and the District of Columbia expect increases of 10 to 20 per cent.

The biggest regional improvement for 1961 is reported by the New England states, which expect to show an over-all gain of 32 per cent over 1960, led by Connecticut—up 55 per cent—and Massachusetts, up 32 per cent.

A moderate increase of 7 per cent is indicated for the Middle Atlantic states. New York's massive program will grow another 3 per cent to about \$300 million in 1961, and New Jersey expects to show a dramatic increase of 25 per cent from \$68 million to \$85 million.

The East North Central region—with Illinois plans not yet announced—will show an average increase of 6 per cent. The big gain here will be in Wisconsin, whose road program will rebound to its high 1958 level with awards climbing 41 per cent from \$68 million to \$96 million.

The West North Central region will average a 1 per cent decline, although Nebraska and Kansas estimate they will gain 20 per cent and 6 per cent, respectively.

Moving now to the southern U.S., the average gain for the South Atlantic states is 30 per cent.

The prospect for the East South Central region is about the same as in 1960.

Every state in the West South Central region reports it expects its 1961 award level to be the same as in 1960.

The Mountain states, paced by Montana's anticipated 1961 increase of 86 per cent, are expected to show an average gain of 21 per cent.

The Pacific region will average a 5 per cent decline, most of it accounted for by a \$20 million decrease in California awards.

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For details on this and other Goodyear special-duty tires, and the Goodyear Contractor Service, see your Goodyear dealer. Or write Goodyear, Truck Tire Dept., Akron 16, Ohio.

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# Transportation in emergency

During the annual meeting of the American Association of State Highway Officials, which wound up in Detroit last month, a general feeling of uneasiness could be detected. Even though Representative John A. Blatnik, Chairman of House Subcommittee Investigating the Federal Highway Program, failed to appear for his scheduled address, the result of his work is having an impact on this top group of highway officials. Outgoing AASHO president, David H. Stevens of Maine, reminded the convention of the "improper handling of public funds, improper relationships between engineers and contractors, and poor workmanship which has been discovered in some of the states." He warned that such improper practices, together with the trend toward centralization in the federal government

and the very size of the national highway program, definitely threaten the existing federal-state relationship.

Less suavely put was the gruff bravado of one committee chairman who told his meeting, "To hell with the Blatnik committee and all the rest of them." Nonetheless, the AASHO devoted one entire session to a panel discussion of "Quality Management of Highway Construction." While the AASHO is a loose federation of member states, which participate on a purely voluntary basis, it is generally felt that all states will fall in line with more rigid control of contract management. Such a tightening up has certainly been accelerated by the Blatnik disclosures.

The only contractor on the session program, M. Clare Miller, new president of the Associated General Con-

tractors, warned against undue severity in applying controls that might result in limiting production. He reminded the highway officials that the cost of road building is largely determined by the contractor's efficiency in production. If the contractor gets held up by involved inspection procedures, any resulting delays would be reflected in higher bid prices in the future.

But this annual highway officials' gathering developed a topic even more serious than Congressional investigations or the fear of federal domination over the state highway departments. At a meeting of the Emergency Planning Committee, also known as Operation Alert, chairman Everett S. Preston, Director of Highways in Ohio, made an eloquent plea for all highway departments to revise and update their plans for survival in the case of enemy attack. Emergency Planning is one of AASHO's newer committees, but under chairman Preston this group has explored all possible angles in which the many individual state highway departments can facilitate the movement of the traveling public on the highways under emergency conditions.

Director Preston cited the first most important step to take—to have a "relocation site" available for a state's highway department headquarters, complete with duplicate records. Thus if a strike is aimed at a principal city where a department is

headquartered, the department could still function with other personnel at this alternate location. Arkansas has already established possible alternate headquarters in each of its highway department's ten district offices. Essential records are maintained in these alternate locations. All department personnel is being informed, trained, and instructed in their respective duties during an emergency.

The Emergency Planning Committee is also calling for the training of radiological monitors, and many highway departments are now engaged in giving the necessary courses to its employees. In Maine, for instance, one man from each division office and one from highway headquarters took a radiological monitors instructor's course. When Maine's construction season was over last January, the new instructors gave the course to all foremen, supervisors, etc., until all engineering personnel and aides, totaling 567, had qualified as monitors. Every person in the class became thoroughly familiar with the use of the Geiger counter.

Other factors in emergency planning, emphasized by Preston's committee, were emergency highway signs, first-aid courses, and communications. Ohio reported that it could get a message through under almost any emergency either by telephone, teletype, or radio. The Department of Highways has a state-wide radio network that blankets Ohio with 99 per-

## Surveying Washington..

by E. E. Halmos, Jr.



### Pressure is on for action on labor, urban development

As expected, pressure is building up for legislation in the areas of construction labor and urban development, even while the new Congress and Administration are getting organized.

The AFL-CIO's Building Trades Department announced soon after the elections that its principal objective remains common-situs picket-

ing—permission to strike a construction job over a dispute with only one of many employers. C. J. Haggerty, Building Trades president, said that the unions will also push for nine other legislative objectives, including federal aid for school construction, housing and slum-clearance programs, extension and increase of the minimum wage, liberalization of the Davis-Bacon Act, and acceleration of highway and airport construction programs.

The big push on these matters will come when the building trades stage their annual legislative conference in Washington at the end of March.

On urban affairs, big-city mayors who make no secret of their feeling that the new Administration owes them a great deal are pushing hard for a cabinet-level department of urban affairs.

However, despite this pressure, there's no certainty that anything like these bills will go through.

There's ample opposition to them in the conservative wings of both houses of Congress.

### Fund pooling for highway, urban-development programs

Contractors should look with interest at the new scheme okayed by the Housing and Home Finance Agency and the Department of Commerce, under which funds of the two agencies can be pooled for joint planning of highways and urban-development programs.

Under present highway legislation, 1½ per cent of total program funds can be used for planning and research work in connection with the federal-aid program. Under housing laws, HHFA makes grants to communities for planning in metropolitan areas and for comprehensive programming of urban-renewal activities in individual communities.

Under the new scheme—on an experimental basis for a time—highway and urban funds will be used jointly in an urban area for both highway and general urban plans including land-use controls and housing.

The plan is expected to result in better use of available funds and less cumbersome coordination work.

The first step in the new program will be the appointment of a Joint Steering Committee representing the two agencies to work out methods for the joint use of funds. It is expected that regional joint committees will be set up later.

### Ruling on Davis-Bacon Act may aid contractors

On labor matters concerned with federal-aid highway work, the Comptroller General has issued a ruling that penalty provisions of the Davis-Bacon Act do not apply to work done under the Highway Act of 1956.

The ruling could halt enforcement against contractors who may be "blacklisted" under Davis-Bacon provisions for failure to comply with wage-and-hour rulings of the Department of Labor.

It was reported in Washington that the office of the Attorney General had also reported to the labor department on this matter, and that his opinion differed from that of the Comptroller General. However, no public disclosure of the Attorney General's opinion had been made.

### Federal investigation of interstate compacts

Action by the Department of Justice, charging contempt of Congress against officials of the Port of New York Authority for failure to answer questions of an investigating committee, is being watched in Washington.

One immediate result will be revival of a bill introduced near the end of the last session of Congress that would exempt interstate compacts such as the PNYA from such Congressional prying.

The matter is extremely serious for the construction industry, since so much work in the field of sanitation



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manent and 72 portable base stations, 2,254 mobile units, three airplanes, a helicopter, and four walkie-talkie units.

AASHO's Emergency Planning Committee has done a tremendous amount of work in a very short time. If it can urge all its member states to work for the goals chairman Preston has set forth, the country could have a trained force of approximately 300,000 highway maintenance workers on call. This would be the equivalent of 15 army divisions, except that these men would be skilled in first aid and radiological monitoring, as well as trained in maintaining communications over the nation's highways. And the problem of volunteer workers, which has plagued the Office of Civil and Defense Mobilization, would be absent.

This emergency planning for highways is a grim business. How it is handled is just as important to the country as what the Blatnik committee is investigating. As Owen R. Jones, deputy assistant director of OCDM, told the group:

"We expect that you will keep the roadways open and traffic moving freely over them. If roadblocks and damage occur, we expect that you will take the lead in correcting these. Highway regulations, directed movement, evacuation plans, radiological monitoring and all the rest, are the means whereby the over-all job will be accomplished."

and water control, as well as highways, ports, and other areas, is done by somewhat similar compact-based authorities. Last year, when a House committee began to demand information about PNYA's operations, officials (backed by the governors of New York and New Jersey) refused to answer questions on the ground that Congress had no right to interfere with operations of the organization since it was operated by the two signatory states.

Congressmen argued that, since the federal government must approve interstate compacts, Congress has the right to investigate them.

That action brought introduction of a bill to exempt authorities specifically but the bill was introduced within the last few days of the session and had no chance of enactment. You can be sure it'll be introduced again.

#### BPR 1961 estimates on highway program

According to Washington sources, the report on costs of the 41,000-mile interstate highway program—due from the Bureau of Public Roads early this year—will show little change from the estimates prepared in 1958, and very definitely will not be greater.

If the program is in line with the '58 estimates, it will be a major tribute to contractors, as well as engineers and planners, in keeping costs down.

JANUARY, 1961

### Rex M. Whitton appointed new highway administrator

■ Rex M. Whitton, chief engineer of the Missouri State Highway Commission, has been named Federal Highway Administrator, succeeding Bertram D. Tallamy of New York.

With the Missouri department for 40 years—since he was graduated from the University of Missouri in 1920—Whitton started as a member of a highway survey crew. He has been chief engineer since July, 1951.

Whitton, a Fellow in the American Society of Civil Engineers, is married and has a son, who is a practic-

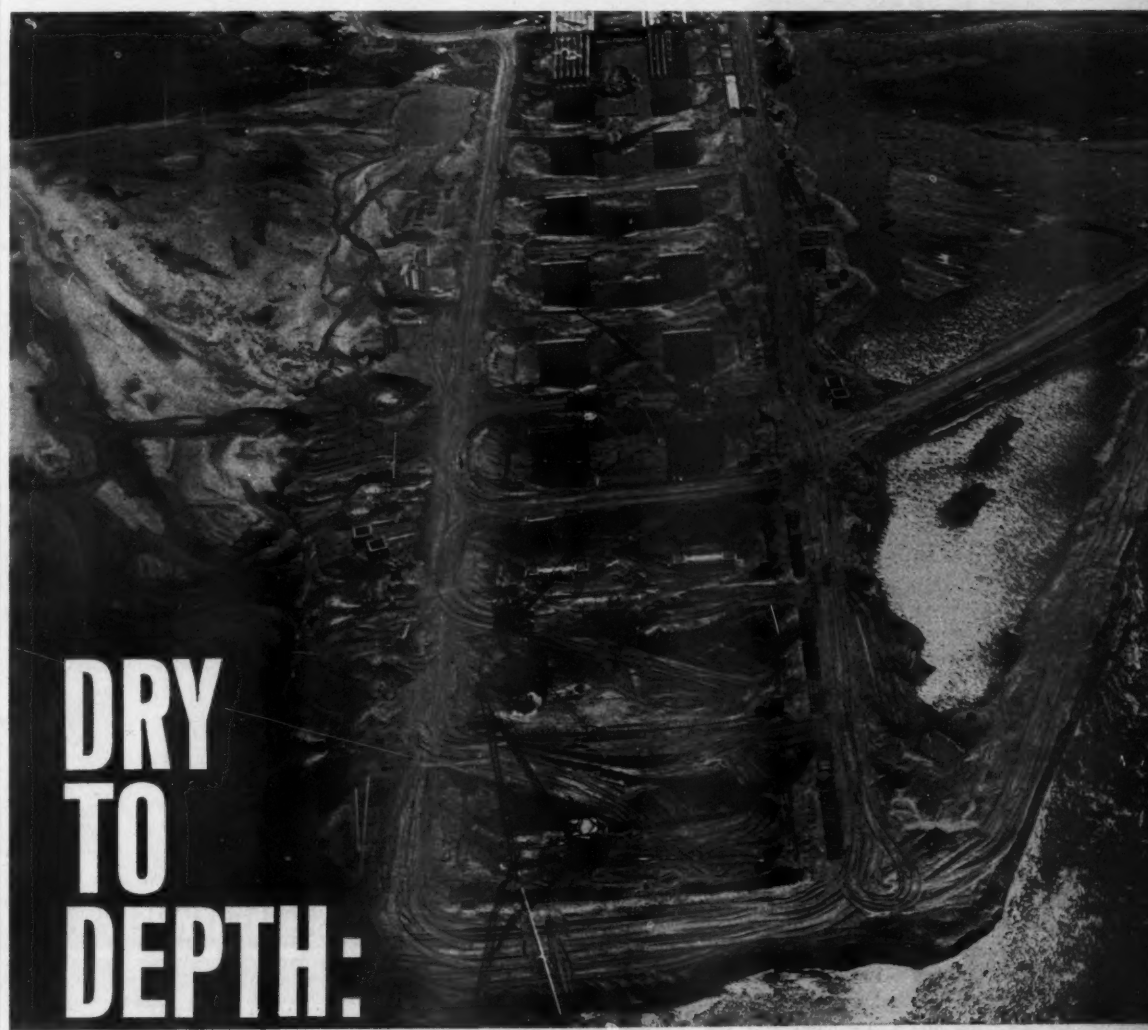
ing engineer in St. Louis.

The 62-year-old Whitton has been highly commended by public officials and professional groups during his career. A past president of the American Association of State Highway Officials, he is the only member to be given both its George S. Bartlett Award (1958) for his contribution to highway progress and its Thomas H. MacDonald Memorial Award (1960) for outstanding service.

Whitton, together with Tallamy, was recently designated by the American Public Works Association as one of the top ten public-works men of the past year.



Rex M. Whitton



## DRY TO DEPTH:

### Stang pumps 35,000 gpm of water to dewater in the treacherous Platte River

Bridge jobs are often dewatering problems and the project pictured above is a case in point. Bridging the Platte River, the twin lane 60' wide, 1500' long crossing required 26 piers. The problem of quickly dewatering the sandy site of these piers 18' below water table without disrupting the planned progress of the contractor was neatly solved by the Stang Corporation. After doing a complete analysis of the project requirements, Stang engineers designed a unique

"leapfrog" wellpoint operation whereby five independent systems were placed around the first group of piers and then individually moved up as each successive pier was completed—a fast, efficient and effective dewatering job that let the contractor set up the project on a production basis. Solutions to dewatering problems such as this are the specialty of Stang; through proper engineering analysis and design Stang professionals continually save

contractors time, money and trouble. Give them an opportunity to help you on your next dewatering problem. Contact any of their seven national depots and there'll be a man on the job in the morning.

JOHN W.

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ENGINEERS & MANUFACTURERS OF DEWATERING  
EQUIPMENT, WELLPOINTS & PUMPING SYSTEMS  
DEWATERING—PLANNING—EQUIPMENT—SERVICE  
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For more facts, use Request Card at page 18 and circle No. 253

## Tricks of the Trade

# Extra hour on cleanup of paving rigs pays off in operation, maintenance

"Keep them clean" is the motto of Roy L. Houck Sons Corp. concrete paving spread. At the close of each day of paving, all the men of the crew work an extra hour to clean the concrete and other dirt off the machines of the paving train. The 9-hour shift usually starts at 6 a.m. and paves 8 hours until 2:30 p.m., with half an hour for lunch. After 2:30, they work another hour on cleanup.



As soon as each machine has completed its paving operations for the day, it is run ahead on the forms. The three water trucks that have been serving the paver bring up full loads of water. The workmen scrape and brush off all accumulations of concrete and then hose down the machines with water supplied under pressure from the pumps on the water trucks.

This is not just a superficial outside cleanup. The men get in under the machines and scrape, chip, and brush until they get off all the concrete. In the case of a machine such as the special Houck-built rig that vibrates the reinforcing steel mats into the concrete slabs, this means crawling under the machine and



## LUBE LOGIC

## Five ways to

### Now's the time for battery check-ups

With cold weather ahead, your batteries will soon work harder than ever. Here's how you can help make sure they're up to it:

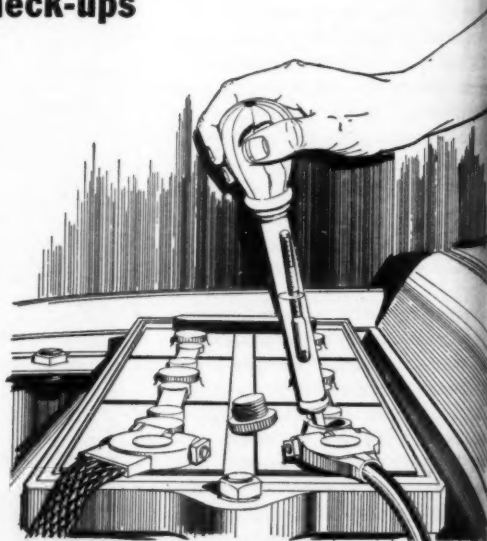
#### Inspection

- Inspect battery case for cracks and leaks. See that vents in cell caps are open.
- Check battery posts and cable clamps for looseness, breakage or corrosion.
- Using distilled water, bring electrolyte in each cell up to level indicated in cell opening.

#### Hydrometer test for specific gravity

- Use a temperature-corrected hydrometer to test the state of battery charge. Make sure battery has not been recently fast-charged, nor water added.
- Draw enough fluid from each cell to raise float off the bottom of the hydrometer tube. Holding hydrometer straight up-and-down, take eye-level reading of the neck of the float. Repeat for each cell.
- Note the temperature, and correct hydrometer reading by subtracting 0.004 from the reading for each 10°F. below 80°F. (Example: If hydrometer reads 1.280, and temperature is 70°F., corrected reading would be 1.280 - 0.004 or 1.276.

Normal state of charge for 12-volt battery is 1.260 to 1.280 specific gravity. For a 6-volt battery, 1.265 to 1.290 specific gravity.



## LEADING CONTRACTORS—EVERYWHERE—RELY ON TEXACO LUBRICATION



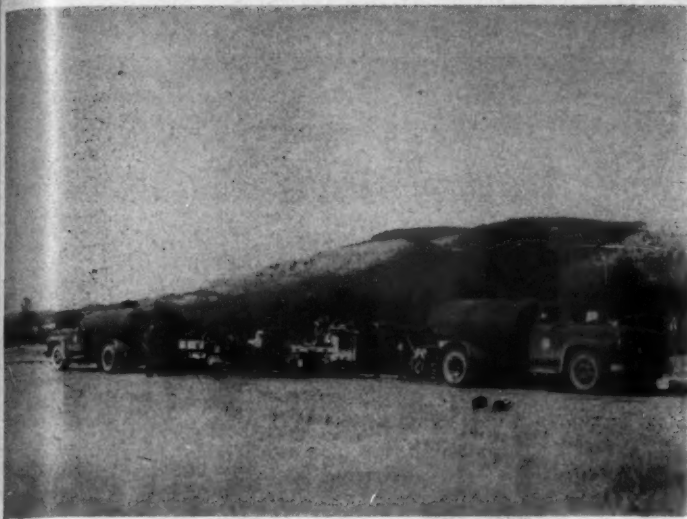
▲ Isbell Construction Company bulldozers remove reefs from river channel on Truckee River Flood Control project near Sparks, Nev. Isbell heartily endorses Texaco's Simplified Lubrication Plan.



▲ Interstate Highway 80 Project at Colfax, Iowa. Texaco Engineer E. A. Rolwes (right) works closely with Mott Construction Company on the important assignment of keeping equipment on the job and maintenance costs low.



▲ Ledbetter-Johnson gouges out largest rock (306 ft.) east of Rockies in highway project near Dalton, Ga. This company uses Texaco Lubrication to keep their equipment on the job . . . their costs down.



cleaning every inch of the steel angle frame that forces the reinforcing down.

The result of this cleanup is more than a good-looking paving train every day. It pays off in reduced maintenance as well as better and more efficient operation.

In the picture at left, the water trucks stand by to supply wash water to the paving train, which has been lined up for the cleaning operation. On the opposite page, top picture, crews hose down a Rex transverse finisher after scraping off concrete; lower picture, men work under the rig that places the reinforcing mats to scrape concrete off the grid of steel angles that sinks the reinforcing into the fresh concrete.

## Dry air cleaners reduce engine wear



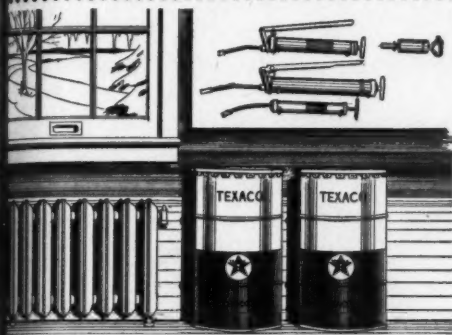
Converting from oil-bath-type to dry-type air cleaner on older models of earthmoving equipment has produced unusually good results for Johnson Bros., Pierre, S. Dak.

Take its Cat D8, for example. The 1954 model (Series 13A) had been requiring frequent engine maintenance. Dust getting into the engine made overhauls necessary after about 2,500 hours of operation. Two years ago, the firm changed the oil-bath cleaner to a Caterpillar dry-type air cleaner. Johnson Bros. hasn't had to overhaul the engine since. Similar benefits have been obtained by converting the cleaners on DW21 scrapers.

Says the khaki-clad president of the company, Keith Johnson, with his hand on the dry-air cleaner of the D8, "Air cleaners have cut down on our overhauls and made it easier on turbochargers."



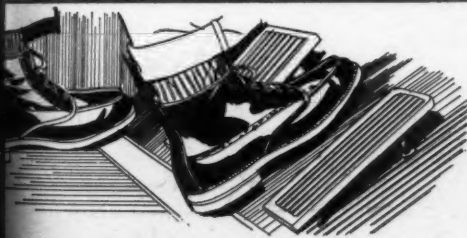
## tease winter maintenance



### Grease guns like it warm

Warm grease guns this way, properly racked to avoid damage, and they'll give you much better service. Incidentally, lubricants like to be stored warm, too.

Warm up the guns if they're too cold to pump the lubricant. Best way is to bring them into a warm place far enough in advance of use. Don't ever attempt to warm them up by direct application of heat.



### Easy does it"... after an oil change

When an engine's crankcase is drained — so is the oil pump's intake sump and pipe. And when the engine starts the oil pump must first suck up a lot of air before it starts pumping oil.

To avoid possible damage to the engine, idle it first at low speed. The oil pressure should begin picking up in a matter of seconds and reach normal readings within several minutes. Wait until it does — before you start working on the engine.



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### Save the engine—not the anti-freeze

Go slow on using last year's anti-freeze. Although it might still give good protection against freezing, chances are those chemical additives that protect the cooling systems of your engines against rust and corrosion have lost their punch. Your best bet, after draining and thoroughly flushing the radiators, is to fill them up with fresh new anti-freeze — such as Texaco P-T Anti-Freeze.

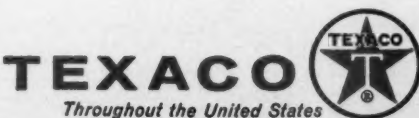


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- How to use lube records to make rigs more valuable
- Special purpose lube rigs
- Pros and cons of mobile and centralized lubrication

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**First major construction  
begins at John Day Dam**

# Gravel processing plant at work in record time

by RALPH MONSON, field editor



Two D9's load a Kolman 42-inch conveyor feeding a Symons vibrating grizzly ahead of the Cedarapids 32 X 42 primary jaw, which reduces oversize to minus 6-inch. Conveyors will extend some 600 feet back into the pit.



Material goes from the primary setup to the primary surge pile by a 36-inch 270-foot conveyor. The belt, powered by a 75-hp motor, rises at an angle of 16 degrees to a height of 75 feet.

Some kind of speed record was probably broken in the design and erection of the aggregate-producing plant for the first major construction phase at John Day Dam on the Columbia River. On February 12, 1960, M. V. Johnson & Associates, Boise, Idaho, started working on the design of the big setup. Less than four months later, the plant was in operation; first concrete was placed on June 4.

This north-shore phase of the project, which has a total cost of some \$400 million, is being built by Montag, Halvorsen, McLaughlin & Associates, Portland, Ore., under a \$33.9 million contract with the Walla Walla District of the U. S. Army Corps of Engineers. There have been several preliminary contracts, including road and railroad relocations, construction of the cofferdam, and excavation. (See "Dozer and Belt Load Shot Rock," C&E, March, 1960, page 124.)

The joint venture has H. O. "Hank" Montag as project manager. On his staff are general superintendent Daryl Mason, project engineer Harold Johnson, assistant project manager Robert DeBolt, excavation superintendent Robby Robinson, aggregate-plant superintendent Pete Kinyon, concrete-plant superintendent Vern Nichols, and geologist John Pietz.

On the field staff for the Corps are resident engineer Hubert B. Elder, chief of construction branch R. E. MacMullan, chief of engineering branch Robert E. Martin, chief of concrete and materials Ivan Bechtold, and district engineer for Walla Walla District Col. Paul H. Symbol.

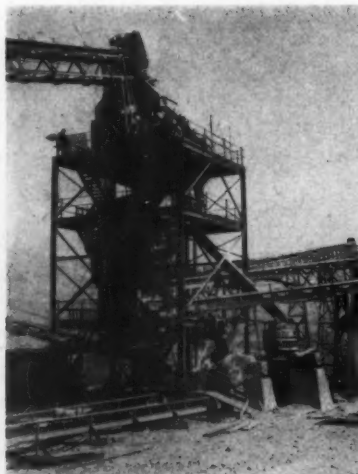
The aggregate plant is one of the largest setups in the West, having rated capacities of 700 tph from the gravel plant and 200 tph from the sand unit. The two units have often exceeded these ratings, producing well over 1,000 tph together. The plants must produce 1.4 million cubic yards of aggregates in five sizes, ranging from 6-inch to sand, for the million cubic yards of concrete in this contract.

Disregarding the Corps designation of a more distant gravel pit to supply the coarse aggregates, the joint-venture contractor developed a convenient deposit that proved adequate and economical. The four sizes of coarse aggregate are being produced from this pit, while sand is barged from a deposit on the John Day River, some two miles upstream and on the opposite shore.

In developing the nearby deposit for coarse aggregates, the contractor is able to move the material entirely by belt conveyors from the pit to the concrete plant. Here's how it's being done:



Material goes from the stockpile to a 36-inch 420-foot conveyor, lower left, which delivers to the main crushing plant. The belt at center foreground returns crushed material to the main feed belt.



Pairs of triple-deck Hewitt-Robins screens on the top two decks separate the four sizes. Oversize and some 3-inch go to the Symons 4-foot cone and Cedarapids roll crushers.



Stockpiling belts cross a rail line. A conveyor from the recovery tunnel leads to the rescreen plant. The inclined conveyor, upper right, leads to the Johnson plant; the sand belt joins the inclined conveyor at the base.



Three larger sizes of aggregate are discharged through rock ladders that take round particles down without segregation.



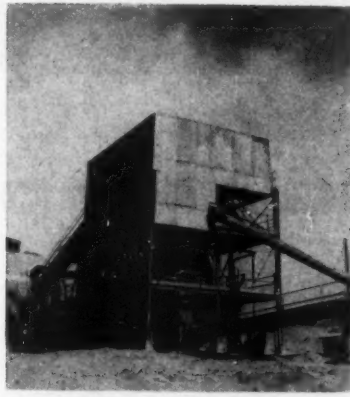
At the rescreen plant, H-W screens separate aggregate into four bins. Air controls hold other sizes in bins as one size goes to the conveyor.



Four sizes of coarse aggregate are fed from the conveyor, through the rescreen plant, and into the bins of the big Johnson concrete plant. Sand comes in on the low, long conveyor in the background.



Sand is obtained on the opposite side of the river, several miles upstream. A high wind whips sand out of the Michigan 275A that feeds the sand-processing plant.



The Michigan dumps the raw sand to a trap and a belt feeds it to the plant, which is partly enclosed with plywood. The conveyor, right, delivers finished material.



Raw sand from the conveyor at top goes through a Hewitt-Robins 6 X 16-foot screen and two Eagle sand classifiers to two Eagle dewatering screws.



The Hewitt-Robins screen at the sand-processing plant is equipped with water sprays to increase the speed and efficiency of screening.



Three Dart 15-yard trucks haul to a loading dock and dump to a conveyor that loads barges for the trip to the job site on the opposite bank.



One of two tugs—converted from landing craft—pushes barges to job site. The fire raging on the opposite bank did not hamper operations.



A Michigan 125A transfers sand to a conveyor system that takes it to stockpile. A gantry with clamshell has replaced the tractor shovel for this job.



Sand travels this inclined conveyor to a Link-Belt tripper that builds stockpiles over a recovery tunnel feeding the concrete plant, background.



Cement and pozzolana are unloaded from barges by air-operated equipment and sent to storage silos near the plant.



This is the west cofferdam area of the John Day Dam, where all the work under this contract will be done. Dikes and the cofferdam keep the river out of the work area. THE END



Road camp—something nearly forgotten in today's contracting business—flourishes on the plains of southeastern Montana in an up-to-date version, where it fits the operations of contractor Myrl Clark of Yankton, S. Dak. Most of the trailers in the camp are privately owned, but five are used as quarters by about 40 single men. Inexpensive food and beer for single men, plus fire water and electricity are all, are provided by the contractor.

## The road camp goes on

At night, the roar of trucks is replaced by strumming guitars in this streamlined road camp that survives in Montana

by BILL ALLEN, field editor



Good hot food—and plenty of it—is served up in the cook shack for the single men by the kind of cooks mothers thought they were. Leola Ridgway, left, and Alice Neumiller are wives of two crew members.



The crew stokes up with good grub. The single men pay \$3 per day for meals and lodging in trailer-bunkhouses. Myrl Clark makes sure that the table is always loaded.



To save time at noon, Leola and Alice bring substantial lunches to the men out on the road. Truck driver Broyles is stocking up from the hefty assortment.



With the nearest barber shop several miles away—and generally closed by the time men quit work—dozer operator Barney Stoltz takes over the barbering chore in the shop trailer.



When work is finished, Harry McGilvrey, dressed real cool, and Leonard Matuska entertain the boys in trailer bunkhouse with a little guitar strummin'. With sufficient lubrication and encouragement, Leonard also sings.

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The old roadway, topped with a double-penetration coat, is ripped by an Adams 660 grader.



A Seaman-Andwall Trav-L-Plant follows immediately to pulverize the loose asphaltic material.



The ¾-inch gravel for the base is picked up by a 23-ton Fruehauf pulled by an I-H 190.

They don't hardly run a road job this way any more. They don't set up a trailer village for the men and their families. They don't hire the best cook in the county to keep the men happy. They don't move from one job to another like one big family.

Most contractors don't, but Myrl Clark does. His operation fits the region where he works. In the sparsely populated, sun-parched land of South Dakota and eastern Montana, he finds that a road camp has many advantages.

The men don't have to spend a couple of hours getting to and from the job. They are always on hand when they are needed. Single men like the cheap rates and the good food. Married men enjoy living with their families. Both single and married men stay with the company year after year and get to know their jobs well.

#### High production

Although running a road camp may sound out of date, there's nothing old-fashioned about the way Myrl Clark of Yankton runs the job. For his gravel-base and asphalt work, he buys the latest and the best equipment. The combination of modern equipment and experienced men adds up to high production.

In fact, Myrl Clark set a record in asphalt production that few contractors can equal. In 1957, east of Sturgis, S. Dak., his Pioneer continuous plant cranked out 4,100 tons in a 12½-hour day, or an average of 328 tph. This quantity was laid down in a 2-inch-thick 13-foot-wide mat by a single finishing machine.

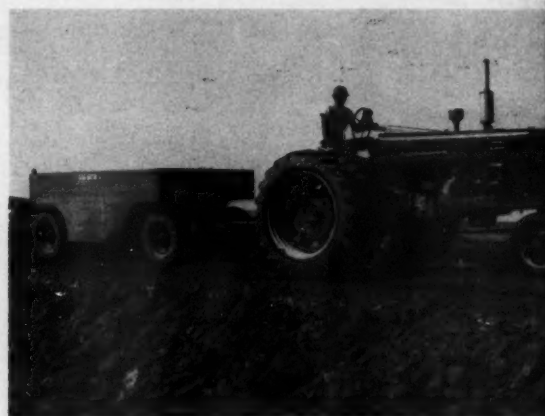
#### Middle of nowhere

On a recent job, the road camp was set up on the barren plains of southeastern Montana. On one side of the camp, U. S. 212—a thin black line leading to the horizon—cut through the dry stubble. On the other side of the camp was an improvised air strip for fast plane transportation to distant cities. Near the camp, a big

(Continued on next page)



This Adams 660 grader has plenty of chores. Here it blades the base material. It also cut out soft spots in the original base.



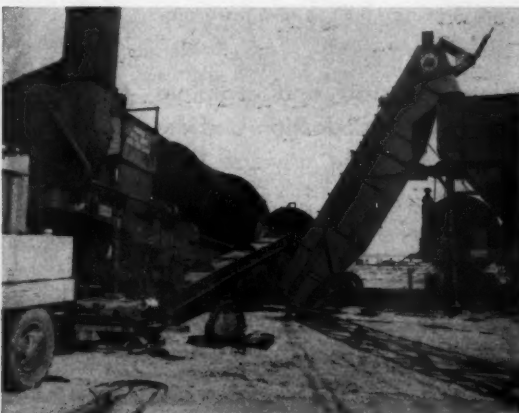
Base compaction is handled by a Browning rubber-tire roller pulled by an I-H Farmall 400.



While a Fruehauf 6,000-gallon tank wets the gravel to keep the dust down, a pilot car leads a line of traffic through the job.



SS1 emulsified asphalt is applied by a Rosco 4,200-gallon distributor pulled by a 190 tractor.



This Pioneer plant turns out the surfacing material, which is brought by elevator to the screens for a 2-way split.



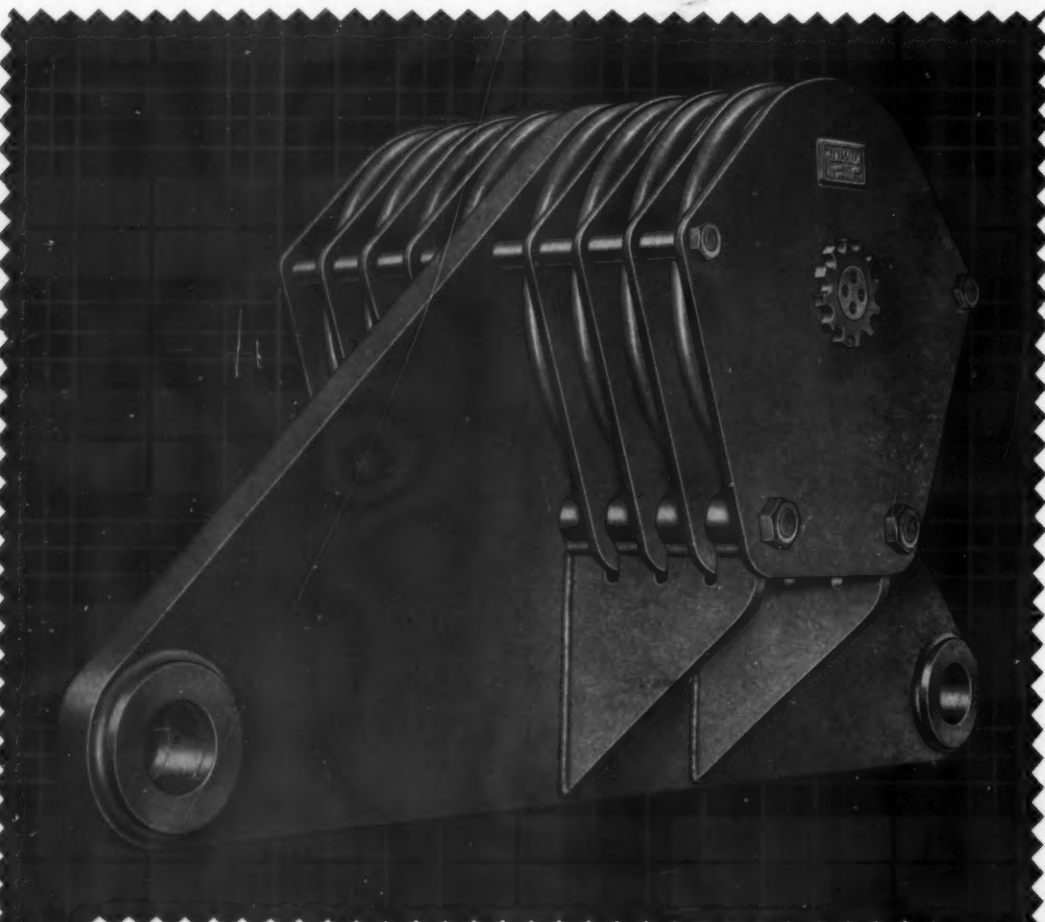
A truck is tied to the Pioneer finisher by a contractor-designed device resembling a couple between railroad cars.



The Fruehauf dumps through underbody gates. Some 400 tons of the gravel was added per mile to the chopped-up material. For quantities, the job demanded about 30,000 tons of plant-mix asphalt and 25,000 tons of crushed gravel.



Myrl Clark, right, and Don Brown, center, of Brown Oil Co., Winner, S. Dak.—the firm that supplies diesel oil and gasoline for the job—and pilot Nels Torberson stretch after a flight back to camp from a highway letting in Pierre. Clark owns an interest in the Beechcraft.



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(Continued from preceding page)

asphalt plant belched smoke as it dropped hot asphalt to the waiting trucks.

The camp was nearly as large as the nearest town of Hammond, some 8 miles away. With 41 trailers and about 150 men, women, and children, the trailer village was a community in itself. Two 30-kw diesel-driven generators kept trailer lights burning. Two 3,000-gallon tank trucks alternated to supply water to the trailers. Both services were furnished to the residents free of charge.

Most of the trailers are owned by the families living in them, but ten are the property of the construction company. Five serve as sleeping quarters for as many as 40 men (at \$3 a day per man for bunk and board). Other trailers provide facilities for a shop, warehouse, parts depot, and cook shack. Myrl Clark lives on the job with his family in his own trailer.

Believing that the quickest way to good production is through a man's stomach, Myrl has recruited from among the men's wives two excellent cooks—Alice Neumiller and Leola Ridgway. In the cook shack, they serve a family-style breakfast and supper to the single men. For lunch, they load up a station wagon with sandwiches, fruit, soup, and drinks, and bring the meals around to the men on the job. Says Leola, who's been cooking for the crew for the past eight years, "We haven't lost a man yet."

### Strumming guitars

With trailers clustered together like a wagon train bedding down for the night, the road camp is a friendly, family place. After the roar of the trucks has stilled, after the men have stoked their stomachs with good food, you can hear the clink of horseshoes. You can hear the shouts of children as they play softball with their dads. From the bunkhouse comes the strumming of guitars and the occasional clank of an empty beer can. In the lingering light of day, Myrl—big father of the camp—rests his frame on the steps of the shop trailer. One of his boys drops by and asks when the crushers will be moving out.

CONTRACTORS AND ENGINEERS

Off on the darkening mess, the sheep settle down for the night.

At daylight, the men are up and ready to go for 10, and sometimes 12, hours. Out under the glaring sun, out in the dust, they run their machines and watch the road grow. Right out beside them are the engineers of the Montana highway department. They check the grade, keep track of the loads, and take their tests. They make sure the road is going to be as smooth and stable as Myrl Clark intends it to be.

#### The job

The original section of U. S. 212 was rebuilt in 1955 with a 5-inch sand base and 4 inches of select borrow. Topped with a double-penetration coat, the road was built with the intention of resurfacing with plant-mix at a later date.

It was Clark's job, five years later, to chop up the surface of the old roadway, stabilize the base with emulsified asphalt (using existing and added material), and lay down 3 inches of asphalt. His contract covered 11 miles of 2-lane highway.

#### The methods

A pair of Adams 660 graders spearheaded the operation by ripping up the old highway. Following close behind, a Seaman-Andwall rotary tiller chopped up the loose asphaltic material. Then big Fruehauf 23-ton bottom-dumps pulled by International 190's moved in to drop 400 tons of 3/4-inch gravel per mile. This was bladed, wetted, and mixed with the chopped-up material. Wetting to between 4 and 8 per cent moisture made the material easier to work.

A Rosco 4,200-gallon distributor shot the material with a SS1 emulsified asphalt at air temperature, at a rate of 14 gallons to the cubic yard. A motor grader assisted in the mixing and blading of the material. The 3 inches of stabilized base was compacted with either self-propelled or tractor-drawn rubber-tire rollers. A flat-wheel roller smoothed off the final surface.

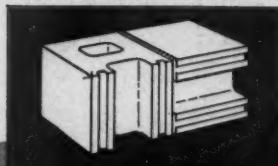
In certain places, the job was slowed down by unexpected soft spots in the original base. The undesirable material had to be graded out with a blade to a depth of 1 or 2 feet and then filled in with crushed gravel.

The contractor had to go a long way for the crushed gravel. His three Cedarapids Master Tandem crushers were set up in a pit about 26 miles from the job. Hauling from the pit were twenty 23-ton bottom-dumps and twenty 14-ton dump trucks. Aluminum bodies, made by Aluminum Body Corp., were used on most of the dump trucks, and they increased the payload by 3,000 pounds on each truck. The bottom-dumps hauled the road gravel while the dump trucks went to the plant stockpile.

#### Trucks tied to finisher

Clark devised a unique arrangement to hold the dump truck to the finishing machine. It is something like the couple joining two railroad cars. A grabbing device on the finisher holds a vertical rod welded to

## Great new things are shaping up in concrete block



Wall designed by Architect Alfred B. Parker, Miami. Photo courtesy of National Concrete Masonry Association.

## Atlas Masonry Cement provides the right mortar

A notable thing about the new look in concrete masonry is what is being done with standard block. Here, for instance, a closed-lattice effect is achieved by laying up "stretcher" type concrete block, so that the ends are exposed. This basket-weave pattern creates an interesting exposed masonry wall resembling hand-hewn stone. For laying up this block, or any concrete masonry unit, ATLAS MASONRY CEMENT continues to be the preferred cementing material in mortar. It produces a smooth, workable mix, provides a strong bond, gives weathertight joints that are uniform in color. And ATLAS MASONRY CEMENT complies fully with ASTM and Federal Specifications. For information on masonry cement write: Universal Atlas, Dept. M, 100 Park Avenue, New York 17, N. Y.



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the frame at the rear of the truck. The finishing machine pushes the truck at this central point. (The rollers on the finisher do not push the truck tires.)

The couple is joined by backing the truck up against the connection point. The couple is parted by a hand lever device. Myrl Clark claims that the arrangement allows better steering control of the finisher. The device also assures the correct position of the truck and eliminates braking on downgrades.

The Pioneer continuous plant, bought new in 1957, has a rated capacity of 200 tph. Under favorable job conditions, however, it can grind

out over 300 tph. On this job, production averaged about 245 tph and went as high as 255.

The dryer of the plant was fed by an inclined conveyor from one large stockpile. A truck-mounted Murphy diesel powered the dryer, the blower for the dust collector, and the fines conveyor. The units were driven by V-belt drives on a long drive shaft. The material passed from the dryer to an elevator that carried it to the screens for a 2-way split.

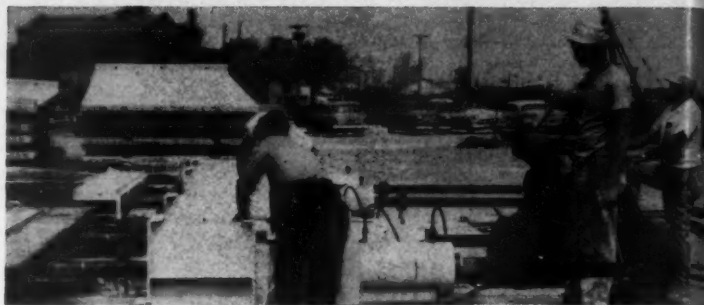
Charles Nohava is superintendent for Clark. For the Montana State Highway Commission, Milo Lahn is division engineer and Walt Reichenberg is project engineer. THE END



Charles Nohava, left, super for Myrl Clark, and Walt Reichenberg, project engineer for the highway department.



**1** Eleven slabs are precast in each 335-foot-long bed. Welded-wire fabric, which saved handling and placement time at the plant, is in place. A workman is pulling a cable to the pull-back rig for the strands. Another man positions 1-inch plastic chairs to keep the welded wire away from the oiled metal forms.



**2** Once strands have been positioned, jacks apply tension, stressing them to 175,000 psi, 70 per cent of ultimate strength. In the background, piled four high, are completed slabs, stockpiled and ready for delivery to the job site.

## A prestressed garage in 15 days

Using a fast erection process with precast structural components, Terry Contracting, Inc., Long Island City, N. Y., built a 1,200-car self-parking garage in 15 days for the Abraham & Straus department store in Hempstead, Long Island. One 600-car unit was built in 12 working days; the second 600-car unit was constructed in less than 72 hours, with crews working around the clock. Freyssinet Co., Inc., New York City, was the consultant on the job, which used the Tierpark system of construction—a method developed by Tishman Research Corp., New York City, for licensing to prestressed-concrete plants throughout the country.

The garage is three tiers wide, with the middle tier having three decks and the side tiers, two. Each of the side tiers is 4 feet (half a tier) lower than the middle section, making for easy grades between floors. Ramp slabs are 1½ times the width of parking slabs. The entire structure, equipped with fluorescent lighting, was built at a cost of \$1,200 per car. Excluding the ground-level column footings and asphaltic-concrete surfacing on grade, all components were precast.

Beams and girders were eliminated in the garage by the use of pretensioned 2-way cantilever-action slabs that make possible an 8-foot floor-to-

floor height. Rigid moment connections at the junctions of columns and slabs eliminated the need for shear walls and other lateral bracing.

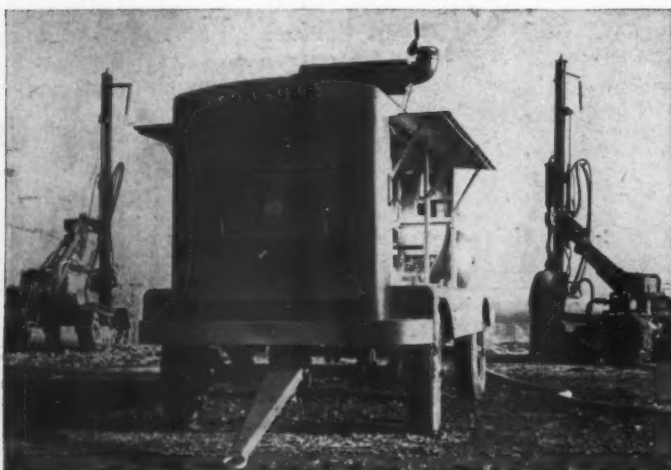
Altogether, the building required 780 prestressed slabs, 28 × 10½ feet; 880 precast columns; and 40 ramp slabs. Each slab was reinforced with three sheets of welded-wire fabric, consisting of 2/0 and 6/0-gage wires at various spacings for an allowable stress of 24,000 psi; prestressing strands; and transverse bar reinforcing atop the strands at various spacings. The actual start of the job was at the plant of Prefabricated Concrete, Inc., Cedarhurst, Long Island, where all the casting was done.



**5** The pickup frame is fastened to the center of the slab by one bolt. Connecting plates in adjacent slabs are bolted to each other.



**9** The joint between the top of the column and the underside of the next slab is dry-packed, and a mason smooths the grout.



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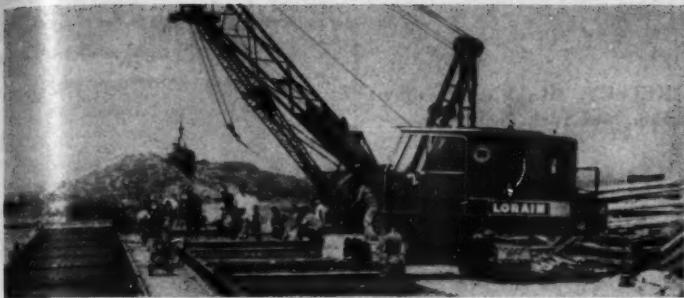
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3 Conventional concrete is placed in the forms by a Lorain crawler crane. The strike-off screed used by the crew has a slight camber to pitch drainage toward the center of the slab, where weep holes will lead into column drains.



4 At the job site, steelworkers guide a prestressed slab over the threaded dowels in its supporting column. Note the torch-cut ends of the strands. The guide line, right, has been fastened through a hole in the side connecting plate.



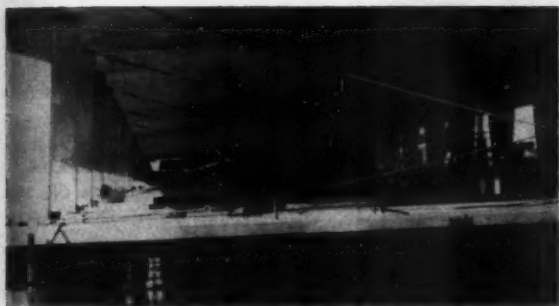
6 A steelworker runs up bolts that pass through connecting plates in adjacent slabs. A typical slab has eight such connection recesses, which are grouted.



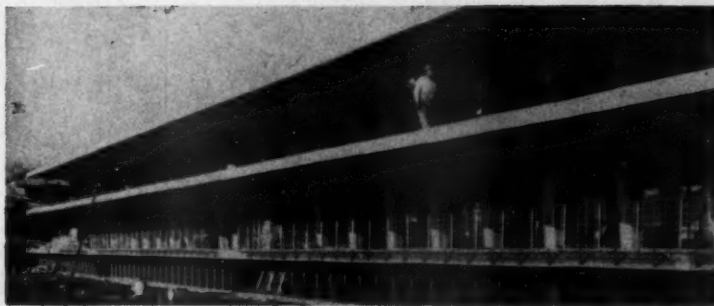
7 With a slab in place, workmen guide a column into place to support the slab above. Here, the base plate of the column is being guided over four threaded dowels that project through the slab from the column underneath.



8 The base plate of a column is bolted to dowels from the column underneath, and the connection is grouted for complete rigidity.



10 Cable X-bracing and steel shoring remain in place until the grout has set between the slab and column joints and in connection-plate recesses. Cables are fastened to slim plates dropped over one of the column bolts.

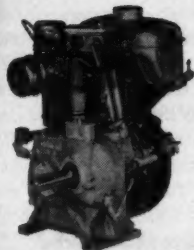


11 The center section of tiers stands almost completed by the morning of the second day. The safety guardrails, made of galvanized heavy welded-wire fabric on pipe frames, is supplied in prefabricated sections. They provide clearance for bumper overhang at edges of slabs. THE END

BIG JOB... SMALL ENGINE?

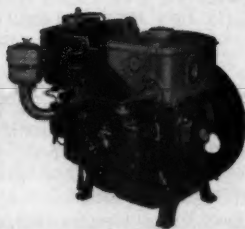
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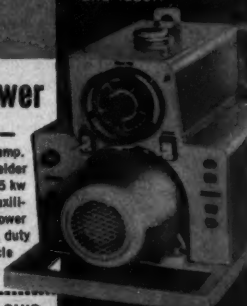
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## Management

# Sell your credit

by HARVEY M. KELSEY, JR., Vice President  
James Talcott, Inc., New York, N. Y.

Contractors know how to go about making a purchase, how much they should pay, and what the financing charge should be. They usually have no trouble in financing equipment, but often have difficulty getting supplemental funds for business operations. This is why it is important to establish credit lines before they are needed.

There are many legitimate reasons why a contractor might need to borrow money: A seasonal need for ma-

terials and supplies; to pay a vendor's bill; to meet his payroll. Sometimes retainages are held up.

If you're operating a sound business, you should be able to get help somewhere. Those who understand the situation probably are getting help. Others are complaining, "The bank doesn't understand my problem." And it may be so; banks are interested only in problems that result in "good" loans. It's up to you to interest the banker.

No one in the lending business, whether he is in a bank or in an industrial finance firm, has time for "blind" research in the contracting field. You must, if you hope to get a loan, provide a two-part "sales pitch."

First make sure that the banker or finance-company official understands construction financing.

Secondly, explain your problem to the banker and tell him what you intend to do to counter it. Point out the steps you have taken to rectify any



past mistakes and the safeguards you have installed to prevent recurrence of the same errors. By being businesslike in your approach, you can be sure you're inspiring confidence, which is an important step in getting a loan.

Don't forget: You need your banker most when you can't meet your note. If the banker knows you and respects your integrity and business ability, he'll be more likely to grant the extension when you need it.

### How to choose an accountant

Another factor that contractors often neglect when setting up a financial program is a good accountant. Your accountant should have the reputation and stature that will inspire confidence. If you don't know which accounting firm is best for you, your banker or finance company will usually be glad to recommend one.

Contracting, even for relatively small operations, is big business in today's economy. Investments can run to several hundred thousand dollars for only a few pieces of equipment.

The importance of proper accounting principles cannot be overemphasized. Contractors with inefficient bookkeeping practices have lost money on jobs they expected to be profitable. Set your records up efficiently and be sure they're kept up to date.

Many contractors often neglect an important facet of financial life by failing to keep in contact with their lenders. To help insure being able to get extra money when you need it, make regular visits to your banker or industrial finance company. They are more likely to grant a loan to a businessman who has visited them before when he has not been in immediate need of money.

By such action, you can build up an established relationship with a lender so that by the time the money is needed, the banker thinks of you not as a man in trouble, but as a careful businessman who foresaw the need for funds before the pressure became acute. Result: Quicker service and more flexible terms.

It is easily possible at times to run short of working capital. If you do, you can refinance current debt by borrowing on equipment you own free and clear. You might sell receivables, or perhaps you can get an unsecured loan—if you've made the proper preparations. If you've been selling your credit wisely, you'll be in a much better position to get a loan.

THE END



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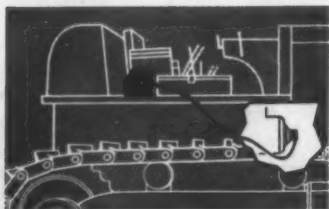
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(B) Flexible drive cable transmits power from gearbox on front of transmission case to sound unit at rear of vehicle.



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ONLY THREE SIMPLE PARTS: (1) Right angle drive mounted on cap of transmission pinion shaft; (2) Flexible drive cable; (3) Sound unit mounted on rear of vehicle.

The distinctive warning signal is produced by a mechanical air pump and horn which operate automatically the moment the vehicle moves in reverse gear. The sound level is practically as high at right angles to the rear of the vehicle (90db at 5 ft., 70db at 100 ft.) as straight behind (95db at 5 ft., 74db at 100 ft.) and can easily be heard above vehicle and area noise.

By completely eliminating the need for troublesome electrical switches and circuits, the Bullard Bull/Horn Alarm ends costly maintenance headaches. All moving parts are precision made and lubricated for life. Once installed, it will operate dependably without attention.

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## Labor Review

### California teamsters negotiate first contract for owner-drivers

Some 1,000 owner-drivers of trucks employed in northern California's construction industry are now working under their first union contract, according to an announcement by the Western Conference of Teamsters. The contract, held by IBT Local 216, applies in 46 counties lying between Bakersfield and the Oregon border.

The union says the agreement sets hourly wage rates of \$4.50 for drivers of semitrailers and \$5.50 for sets of doubles. Equipment must be in the name of the actual owner, but contractors retain rights of control of the manner, time, means, and methods by which owner-drivers perform their services.

The agreement requires that owner-operators be carried on the contractor's payroll as employees under all conditions in the Teamsters' master agreement. Separate checks must be issued for drivers' wages, vacation pay, and equipment, and the equipment must be maintained by the owner-operators. If an operator's services are terminated without just cause, payment for time lost is limited to wages and fringe benefits.

The agreement does not apply on trucking jobs of five days or less.

### Two-year contract signed by boilermakers in 7 southeastern states

Wage rates for boilermakers in seven southeastern states went up 10 cents an hour January 1, and 10 cents more is due December 1, under a new agreement covering field construction work. The 2-year contract also provides for a 5-cents-per-hour contribution to the Boilermaker-Blacksmith National Pension Trust beginning April 1, and another 5 cents an hour after July 1.

A health-welfare contribution of 10 cents an hour is carried over from the old agreement, and employers will continue to pay 1 cent an hour into the established joint apprenticeship fund. The agreement applies in North Carolina, Tennessee, Mississippi, Alabama, Georgia, South Carolina, and Florida.

### Operating engineers form national pension plan for better benefits

The International Union of Operating Engineers announces the establishment of a Central Pension Fund open to all IUOE local unions and employers with whom they have collective-bargaining agreements. The program is presented as a means for providing better pension benefits, at lower cost, by pooling contributions that employers otherwise would be making to separate local programs.

The fund was established about two months ago with the formation of a board of trustees and the adoption of the Agreement and Declaration of Trust. In inviting locals to join the program, IUOE says:

"Realizing that greater benefits can

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Because NAYLOR pipe is light in weight, it is easier to handle and install. Moreover, the distinctive lockseamed-spiralwelded structure provides the strength and safety your job requires.

Likewise, Wedgelock couplings save time in making connections. The work is simplified since a hammer is the only tool required to connect or disconnect them.

Whatever the service—air, water, or ventilating . . . doesn't it make sense to look into this hard-working combination for your operations?

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A NEW ADDITION to the Mountain States Telephone & Telegraph Co. building in Phoenix, Ariz., is being constructed by the Marco Equipment Co. of Phoenix. Placing concrete here is a Bay City Crane Mobile with 130-foot boom and a 1-cubic-yard concrete bucket. The job is expected to be completed by October.

# Grading problemwa

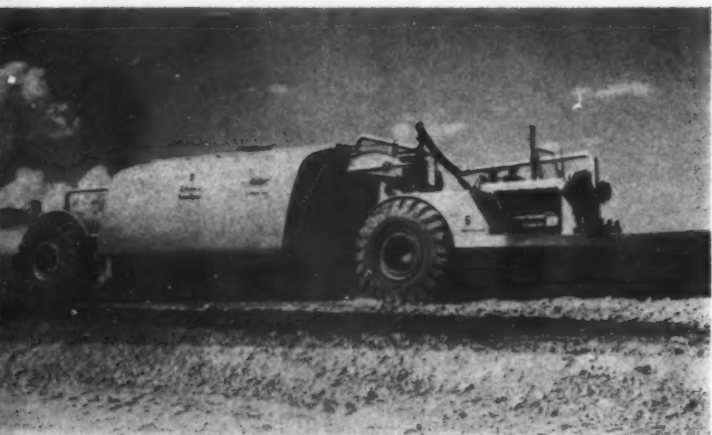
Contractor beats it with pumps boosting wa sump



Some 90 million gallons of water for grading a stretch of Interstate highway in the Sonoma Range near Golconda, Nev., is obtained from wells at both ends of the job and pumped to ground tanks along the alignment. Here, a GMC 6 X 6 applies water in one of the cuts.



Water is also applied to the embankments. A water truck works on this fill as compaction is handled by Southwestern double-drum 5-foot sheepfoot rollers pulled by International TD-14 tractors.



A big Southwest 8,100-gallon tank, with its own pumps for pressure spraying, applies water to the grade. One of two on the job, it was filled at a special overhead tank that loads 8,000 gallons in 1 minute and 10 seconds.



At the east end of the job is one of eight ground storage tanks, where a Johnson vertical turbine pump, powered by a Cat engine, drafts water and pumps it to a storage tank at the summit. A pump in a nearby well fills the tank.



At the west end of the job, a Rex pump powered by a Waukesha engine pumps water into the 2,100-gallon tank of a GMC 6 X 6. The ground tanks were excavated by dozers; material was left around their edges.

## Contractors and Engineers staff article

East of the little town of Golconda in north central Nevada, U. S. 40 leaves the Humboldt River valley and climbs the foothills of the Sonoma Range over a 5,154-foot pass known as Golconda Summit. The ten miles of highway winding up and down this grade is one of the few rural speed-control zones in U. S. 40's 417-mile course across the Silver State.

The present road is a tremendous improvement over the steep, narrow, winding trail it replaced not too many years ago. But the stretch will seem like a trail compared to the 12-mile segment of Interstate now being built to replace it. The \$3,694,000 contract for the grading, base, and paving of the section went to A. D. Drumm, Jr., doing business as the Silver State Construction Co., Fallon, Nev. It is the largest single highway contract ever awarded by the Nevada Department of Highways. (For what it takes to keep the equipment running, see "A Maintenance Setup for Two Years of Grading," page 114.)

While the grading involves some 2 million cubic yards of unclassified excavation, including a sizable quantity of shooting rock, Drumm's biggest problem in this desert area is water. The more than 90 million gallons needed for compaction and dust control must come from relatively small wells at both ends of the job. The water is boosted through seven miles of steel and aluminum pipe to ground storage tanks strategically located along the alignment. One of these is at the summit.

Tank trucks, filled from the ground tanks, apply the water to the cuts as the material is being loaded and to the embankments as they are built.

The contractor got the work under

way last season and, working through the winter, hopes to complete the grading in time to place the base and bituminous surfacing during the summer and fall of this year.

To start the job, the contractor built eight sumps or ground tanks for the storage of water, while a subcontractor was drilling wells in the valleys at both ends of the project. The unlined ground tanks were scooped out by dozers, and the material was used to dike the edges. Five of these tanks have capacities of about half a million gallons each. The other three are smaller.

The wells were drilled to a depth of about 240 feet at the west end and 140 feet at the east end. Fairbanks-Morse vertical turbine pumps in the wells pump around the clock into nearby ground tanks at the low level.

The water must be boosted from these tanks to the other tanks through some seven miles of steel and aluminum 6-inch pipe. The tanks are located at convenient points along the job. The one at the summit is 700 feet above the low tanks near the wells.

To boost the water up the grade, the contractor installed three Johnson turbine pumps on stands built out over the tanks. The pump at the east end of the project is driven by a Caterpillar diesel engine. The others have 75-hp electric motors. Drumm built two miles of pole line to get the electric power to the pumps. A special portable overhead water-storage tank was added to fill the two big 8,100-gallon Southwest tanks pulled by Cat DW20 and DW21 tractors. This overhead tank will load 8,000 gallons of water in 1 minute and 10 seconds. It is automatically kept full by a gas-driven Gorman-Rupp pump with an automatic start-up and cutoff con-

# Water supply

ing water through some seven miles of pipe

trolled by a water-level switch.

Water is loaded from the ground tanks into tank trucks by Gorman-Rupp and Rex pumps. The fleet of water trucks includes nine surplus 6 x 6 trucks with 2,100-gallon tanks, a 6,300-gallon semitrailer tank pulled by a Challenge-Cook Bros. truck, and the two Southwest tanks. These rigs apply the water to the material in the cuts, making successive passes right ahead of the scrapers. The manipulation due to loading and unloading incorporates the water into the material.

If the application in the cuts does not produce the optimum water content in the material, additional water is added on the embankments as the material is being dumped, spread, and compacted.

Two scraper spreads are handling the earthwork—a rubber-tire spread on the long hauls and tractor-drawn

scrapers on the shorter hauls. The latter spread includes six Cat D8's pulling L-W Model W scrapers. Three D8's and three D9's with Ateco rippers loosen the material in the cuts and push the scrapers to speed up the loading cycle. On the fills, a pair of International TD-14 tractors pull Southwest 5-foot sheepfoot rollers while Cat 12 and 14 motor graders work the surface. At times when the scrapers bunch up, both the cuts and fills look like solid masses of machinery—all of it moving.

The long-haul dirt is moved by two Cat DW20's and four DW21's. At the extreme east end of the job, this haul exceeds 3,000 feet. The rubber-tire scrapers are push-loaded by three Cat D9 tractor-dozers, which are also equipped with Ateco rippers. With these big rippers working the cuts, the scrapers actually move a lot of

(Continued on next page)



A Cat DW21 loads with help from a D9 equipped with a big single-tooth Ateco ripper for handling tough material. It's a 3,000-foot haul to the end of the embankment at the bottom of the valley.



Using a LeTourneau-Westinghouse K-30 ripper, a Cat D8 tractor loosens up some of the hard soil ahead of the scrapers. Rubber tires allow the rig to operate on the road without damage.

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Much short-haul material is handled by 6 Cat D8's and L-W Model W's. One rig is unloading on the embankment, which is being compacted by a sheepfoot pulled by a TD-14. At this point near the summit, the new alignment crosses the old road.

(Continued from preceding page)

rock that might otherwise have been of the shooting class.

While Cat motor graders keep the haul roads in shape and work the surface of the fill, an International TD-24 tractor pulls a 3-drum Southwest 5-foot sheepfoot roller for the compaction. When the material is properly watered, compaction is not too difficult. The sheepfoot rollers and the haul units and water trucks working over the fills easily obtain the required 95 per cent density.

#### Big drill takes rock cuts

The scrapers first skipped around over the jobs, uncovering the rock cuts and taking as much as the rippers

could economically loosen. This exposed all of the shooting rock, so that the rock crews could work straight through the winter without delay.

Cuts were drilled out by a Crawl-Drill powered by an Ingersoll-Rand 600-cfm compressor, and by a TD-24 tractor mounting a Hydraboom with a 2D-45 I-R hammer.

On the big rock cuts, one of which contained 550,000 cubic yards, Drummond started with a new Ingersoll-Rand Crawlmaster drill powered by a Gardner-Denver 900-cfm compressor. This big rig punched down the 6-inch holes to depths of 30 and 40 feet in fast succession. But because of the spacing required to make the big holes economical, too coarse a broken product was delivered. The Crawlmaster was teamed with the latest percussion hammer, a 525 with 2-inch Atlas Copco steel, and is being used to punch 4½-inch holes on 13-foot centers at the rate of about 500 feet per day. Down-the-hole drilling is being used in the rock cut.

The rock was shot with ammonium nitrate. At first, two Northwest shovels, a Model 6 and an 80-D, loaded the shot rock into a spread of six Euclid end-dumps that hauled to the fills. Another new 80-D with a Cat 342C engine was later added to the spread. Six Athey units were added as loading equipment when the Cat-powered 80-D went into the big cut.

#### Base and paving

Over the compacted grading section, the contract requires the placing of a variable lift, averaging 5 inches of select backfill. On this is placed a 12-inch course (2 lifts) of minus 3-inch crushed-rock subbase and 4 inches of minus ¾-inch crushed-rock base. The base is primed and surfaced with 4 inches of bituminous concrete in two courses.

The contractor developed a pit adjacent to the right-of-way and is producing all of the base and surfacing aggregates from what he claims to be the largest portable rock plant in the world. It is all on rubber and comprises a Cedarapids 3242 primary crusher and an 1836 twin-jaw intermediate. It has a Symons 4¼-foot cone for rough fine-grading and a Symons 4-foot short head for production of the finer sizes. There are two 5 x 16 screens and five 42-inch x 60-foot belt conveyors to link the various units together. A million tons of straight quarry rock is being handled on the job.

The base materials are being hauled from the plant to the grade by a spread of eight new Challenge-Cook Bros. Earth King truck-trailer rigs carrying 32 tons of material per load.

Since the new alignment crosses the old road in several places and traffic must be maintained through the job at all times, a carefully planned phasing program was essential. This means that portions of the grading and base must be completed and given at least temporary surfacing to carry traffic while the old road is being torn up. Most of the base

## GREENVILLE RIPPER FOR IH TD-15, 20, 25 TURN TRACTOR INTO 4-WAY MACHINE

... rip ... bulldoze ... tow ... pushload without changing tools

**RIP AT ANY DEPTH** ... Pitch and depth control adjustments permit ripping at any depth. From basic settings, operator can adjust hydraulically as required. Settings can be made in seconds. Hydraulic system holds points at desired depth. Shank design and pitch control keep points at best ripping angle.

**LIVE SWIVEL ACTION** ... Shanks smoothly swivel 15° in either direction on heavy pins — seek out weak spots in rock. It gives points a live action that shatters rock with a jack-hammer action. Shanks follow tractor like a trailer.

**FINGER-TIP HYDRAULIC CONTROL** ... Finger-tip control of the "power-matched" hydraulic system exerts Goliath-like power which distributes the weight of the tractor on ripping points for fast, complete penetration.



**BOOSTER RIPPING** ... A push block, straddling the center shank and swing beam can be attached very quickly by pinned connections. This permits use of the combined efforts of two tractors for added ripping power.



**CURVED SHANKS** are available in 24" maximum digging depth for TD-20 and 25. These shanks give their best performance in materials that are not blocky or slabby in formation.



**STRAIGHT SHANKS** are available in 24", 42" and 48" maximum digging lengths for TD-25 and all will adapt to the standard ripper without special attachments. Greenville's straight shanks give top performance in a wide range of materials. 18" penetration shanks are available for TD-15.



**REPLACEABLE POINTS** ... For use with curved and straight shanks.

**THE GREENVILLE TRAILING SWING BRACKETS** work separately, each pivoting about a heavy pin to seek out weak spots in rock. The ripper weight balances dozer, resulting in greater ripping and more usable horsepower.

Tractor	Max. Ripping Depth W/Std. Shanks	Ground Clearance		Overall Width Tool Beam	Tool Beam Cross Sect.	Pump Data (Rear PTO)	Cyl. Dimensions		Pist. Rod Diam.
		24" Shank	18" Shank				Bore	Stroke	
TD-25	24"	31"	—	108"	11" x 12½"	60 gpm @ 1000 psi	8"	15½"	3"
TD-20	24"	24"	—	102"	10" x 12"	44 gpm @ 1000 psi	6"	15"	2½"
TD-15	18"	—	12"	90"	8" x 8"	37 gpm @ 1000 psi	5"	15"	2"

**STEEL GREENVILLE CAR CO.**

EARTHMOVING

EQUIPMENT

**GREENVILLE STEEL CAR COMPANY**

Greenville, Pennsylvania

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INEERS



Project superintendent J. V. Beach, right, and grading foreman Joe Solaeui check on work being done in one of the big cuts.

and surfacing, however, will be placed during the coming season.

#### Personnel

Superintendent J. V. Beach heads the supervisory staff running the job for Silver State Construction Co. The grading foremen are J. J. Montrose and Joe Solaeui. The office manager is M. K. Summerbell. A. D. Drumm, Jr., owner, is giving the job a great deal of his personal attention.

W. O. Wright is the state highway engineer. The work is handled through the newly created Winne-mucca District No. 16, which has Dale Rose as district engineer. V. W. Clyde is construction engineer, and A. A. Howard is the resident engineer.

THE END

#### Joint venture to serve World's Fair exhibitors

Ebasco Services, Inc., Vandeburg-Linkletter Associates, Inc., and Walter Kidde Constructors, Inc., all of New York City, have formed V-E-K Associates, Inc., a new organization that will provide exposition services and facilities for exhibitors at the 1964-65 New York World's Fair.

C. M. Vandeburg, president of Vandeburg-Linkletter Associates, has been named president of V-E-K. Executive vice president is William A. Barrett, Jr., director of facilities, community and industrial planning for Ebasco Services. Also named vice presidents were A. Kingsley Ferguson, sales vice president of Walter Kidde Constructors, and John D. Cassidy, general management consultant for Ebasco.

#### HRB releases report on soil compaction

The Highway Research Board has issued Bulletin 254, "Soil Compaction and Proof-Rolling of Subgrades."

Included in the 35-page booklet are papers on full-scale compaction studies at the British Road Research Laboratory; proof-rolling of subgrades; hydraulic-fill compaction; and rapid determination of the liquid limit of soils by the flow-index method.

The bulletin may be obtained for \$1 per copy from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

JANUARY, 1961



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# NEW

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OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

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#### Graduate scholarships for civil engineers

Chi Epsilon, national civil engineering honor fraternity, has prepared a survey of graduate fellowships, scholarships, and assistantships available to civil engineering students in 1961. Copies of the report have been sent to the civil engineering departments of all American and some foreign colleges and universities. The graduate programs include over 500 individual awards with a value of some \$1 million.

Single copies of the survey may be

obtained, as long as the supply lasts, by writing to Michael A. Spronck, Chi Epsilon Fraternity, Martinsville, N. J.

#### New ACI appointments

The American Concrete Institute, Detroit, Mich., has appointed Robert E. Wilde to the newly created post of assistant secretary.

His main responsibility will be to develop chapter activities. In addition, as principal assistant to the institute's secretary-treasurer, William A. Maples, he will oversee the manage-

ment of national and regional technical meetings and will supervise the development of staff systems and procedures at headquarters. Wilde will also work with ACI technical director Kenneth D. Cummins, and with the technical activities committee, to develop information on a variety of subjects in the field of concrete technology.

Robert G. Wiedyke succeeds Wilde in his previous post as managing editor of the institute's monthly *Journal*. He had been associate editor. George D. Nasser has been appointed assistant editor of the publication.



# 1961: THE OUTLOOK FOR

An industry roundup and business forecast for the

Based on surveys, interviews, questionnaires, and other source materials

What can the construction industry expect in 1961?

That's the big question these days as we move into the new year, and the answer is far from a simple one. But with important qualifications, it looks something like this:

- A new peak in dollar volume of construction activity
- A greater volume of work than in 1960, with major emphasis on highways and housing
- Easier money and stable interest rates
- Fairly stabilized labor costs, in terms of wages
- A slight increase in equipment and material prices

These predictions, and the qualifications without which the picture could easily be a misleading one, are the results of a CONTRACTORS AND ENGINEERS staff project aimed at a general roundup of the industry and an educated guess as to what 1961 holds for construction.

Mindful of the over-optimistic predictions of recent years, CONTRACTORS AND ENGINEERS here presents a conservative estimate of what's in store for the industry this year. The estimate takes a look at five categories: the general construction outlook, the work, money, labor, and equipment.

To be meaningful, the construction outlook must be studied against the background of the nation's economic health as a whole.

Only a few weeks ago, the United States Chamber of Commerce predicted a mild business slump for

the first six months of 1961. Unemployment is expected to be a "troublesome" factor during the year. The word "recession" was being used late last year as economists looked to the new year.

But most observers agreed that construction—although it promises to get off to a slow start this year—is the single bright spot in the picture.

## 1961 CONSTRUCTION OUTLOOK

Viewed against the generally gray background of the economy as a whole, the construction industry's prospects for 1961 appear bright. Spending for new construction is expected to reach \$57.3 billion in 1961. This would surpass the 1959 peak of \$56.2 billion and would represent a 4 per cent gain over the estimated 1960 total of \$55.1 billion.

Adjusted for price changes, the level anticipated for 1961 would make this year the second highest in history in actual volume of work put in place.

Almost every type of public and private construction is expected to show a gain in 1961. The exceptions may be the commercial, public-utility, and sewer categories.

These expectations of Department of Commerce economists are based on the assumption that the nation's total output of goods and services will remain at about 1960 levels. It is assumed, also, that federal, state, and local governments will spend more for construction in 1961 than in 1960. Construction costs, on the other hand, should rise less than in 1960.

## Public Construction

With the resumption of gains for highway construction in 1961, total public spending is expected to exceed \$17 billion for the first time in history. But much of this \$850 million increase in public outlays anticipated for 1961 is attributed to recent gains in spending for educational buildings. This may reach \$3 billion in 1961 for the first time in history.

Highway construction volume is expected to increase \$300 million over 1960. In so doing, it will regain the \$6 billion level of 1959, after having dropped to \$5.7 billion in 1960. It appears likely, too, that in 1961 more of the highway dollar will go into actual construction than in recent years, as progressively smaller amounts are needed for right-of-way purposes. The benefit to highway contractors, therefore, should be even greater than the anticipated 5 per cent 1961 gain would suggest.

It appears, moreover, that the recent upsurge in highway work will be sustained for some time. The results of a CONTRACTORS AND ENGINEERS telegraphic survey of 50 state highway departments show that at least 17 states plan to increase 1961 contract awards by more than 10 per cent over 1960. At least 11 states plan increases in 1961 award levels exceeding 20 per cent. (See "Business Comment," page 5.)

Spending for public buildings, swelled by the 8 per cent rise in educational construction, will also show an important gain in the public residential



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CONTRACTORS AND ENGINEERS

# CONSTRUCTION

prepare the year ahead

FRANK KYPREOS, research director  
E. E. HALMOS, Washington correspondent  
BILL DARDEN, feature editor

category. After a 25 per cent drop in 1960 from the near-billion-dollar-level of 1959, this type of work is expected to rebound by 7 per cent this year. Another substantial gain (14 per cent) is expected in administrative and service building as the federal government proceeds with a record program for building-office space.

Construction of water systems, still meeting pressing industrial and community needs, will rise 13 per cent in 1961 on top of a 9 per cent rise for 1960. Sewer work, on the other hand, is expected to drop by 6 per cent. A factor here is that new, smaller projects are increasingly replacing larger projects.

## Private Construction

Private work will account for \$40 billion of the more than \$57 billion of new construction spending in 1961. Over \$22 billion of this represents residential work, which will probably gain 3 per cent in 1961 after a 10 per cent drop in 1960. The strong upward trend in apartment-house construction (the residential work that is of primary interest to heavy builders) will continue in 1961. However, it results in a less than proportionate increase in total expenditures because of the lower unit costs involved.

The brightest spot of the construction economy in 1960, industrial construction, will again make a gain—though a less spectacular one—in 1961. Last year's increase of 38 per cent to a level of \$2.9 billion will be followed by a 7 per cent gain this year, it is anticipated.

Commercial construction, now at the rate of \$4 billion a year, will gain another 2 per cent. The impetus behind this is the continuing surge in office-building and warehouse construction, which will gain 10 per cent in 1961 on top of a 5 per cent rise in 1960.

Private educational construction, which rebounded in 1960, will continue its rise by an estimated 10 per cent this year.

Spending for public utilities passed the \$5 billion mark in 1960. This year should see a further increase of perhaps 4 per cent to the \$5.5 billion level.

Gas-industry construction, now benefiting from Federal Power Commission approvals for unusually large pipeline mileage back in 1959, will jump 18 per cent to a \$2 billion level. The gain over 1960 will be \$300 million, exceeded only by the \$450 million rise expected in new dwelling units, and matching the expected gain in highway spending.

## THE WORK

Certainly the greatest volume of heavy-construction activity—and consequently a major stimulus to the industry—is concentrated in highway and road

## Three-Year Trend in New Construction Spending

Type of construction	Value (in millions)			Per cent change	
	1959	1960	1961 Est.- mated	1959- 1960	1960- 1961
TOTAL NEW CONSTRUCTION	\$56,233	\$55,100	\$57,300	- 2	+ 4
PRIVATE CONSTRUCTION	39,892	38,900	40,250	- 2	+ 3
Residential buildings (non-farm)	24,469	21,950	22,600	- 10	+ 3
Nonresidential buildings (non-farm)	8,859	10,075	10,550	+ 14	+ 5
Industrial	2,106	2,900	3,100	+ 38	+ 7
Commercial	3,930	4,050	4,150	+ 3	+ 2
Other nonresidential buildings	2,823	3,125	3,300	+ 11	+ 6
Farm construction	1,362	1,300	1,300	- 5	0
Public utilities	4,995	5,275	5,500	+ 6	+ 4
All other private	207	300	300	+ 45	0
PUBLIC CONSTRUCTION	16,341	16,200	17,050	- 1	+ 5
Residential buildings	962	725	775	- 25	+ 7
Nonresidential buildings	4,514	4,800	5,175	+ 6	+ 8
Military facilities	1,488	1,325	1,325	- 11	0
Highways	6,000	5,700	6,000	- 5	+ 5
Sewer and water systems	1,467	1,500	1,525	+ 2	+ 2
Public-service enterprises	551	650	650	+ 18	0
Conservation and development	1,130	1,275	1,350	+ 13	+ 6
All other public	229	225	250	- 2	+ 11

Source: Business and Defense Services Admin., Dept. of Commerce.

building. Expected to reach \$6 billion this year, highway construction will provide work for contractors all across the country, at the same time creating a market for machinery manufacturers, equipment manufacturers and suppliers, and equipment dealers.

In addition to highway work, a substantial amount of heavy-construction activity is sponsored by other federal agencies. CONTRACTORS AND ENGINEERS called on the heads of these government agencies for facts and figures on their plans for 1961.

## Corps of Engineers

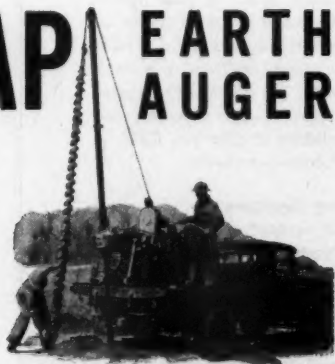
In fiscal year 1961, the Corps of Engineers contemplates putting under contract a total of approximately \$1.1 billion worth of work for its military construction activities, according to Lt. Gen. Emerson C. Itchner, chief of the Corps. About 60 per cent of this total will be for the construction of Air Force projects—the major portion devoted to ICBM missile support facilities.

Included in the over-all figure is \$100 million for Capehart Housing and lesser amounts for the Ad-

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JANUARY, 1961

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(Continued from preceding page)  
vanced Research Projects Agency, Army Reserve Centers, Nike Hercules, Nike Zeus, the National Aeronautics and Space Agency, and the Military Assistance Program.

#### Bureau of Yards and Docks

The Navy's military construction appropriation for fiscal year 1961 is the smallest in the last six years, but the chief of the Bureau of Yards and Docks, Rear Adm. E. J. Peltier, reports items of great importance to national defense covered by the appropriation.

Twenty-eight per cent of the appropriation is for Bureau of Weapons activities. Construction of the Polaris program and development of the Pacific Missile Range will continue.

#### Bureau of Reclamation

The fiscal year 1961 provides for continuing work on 39 regular projects, 5 new starts, and resumption, continuation, or start of work on 12 smaller projects concerned with the water-resource development program of the Bureau of Reclamation, according to Commissioner Floyd Dornin.

The Bureau's 1961 fiscal year construction program comes to a total of \$260 million.

The five new construction starts mentioned above include Florida Participating Project; Colorado River Storage Project, Colorado; Curecanti Unit, Colorado River Storage Project, Colorado; Lower Rio Grande Rehabilitation Project, La Feria Division,

Texas; Yellowtail Unit, Missouri River Basin Project, Montana-Wyoming; and Almena Unit, Missouri River Basin Project, Kansas.

#### General Services Administration

The General Services Administration is currently engaged in the government's most extensive public building program in 20 years. A total of 164 projects in 48 states comprises the current GSA program, and the estimated cost of completing the projects is in excess of \$1 billion.

#### Private Work

Perhaps as good a spokesman as any for construction in the country is Gov. John A. Volpe of Massachusetts, immediate past president of the Associated General Contractors. In a



Gov. John A. Volpe  
The outlook is quite favorable

statement prepared for this article, Gov. Volpe had this to say:

"The outlook for construction in the coming year is, in my opinion, quite favorable.

"New construction work put in place during 1960 has been only fractionally below the all-time high level reached in 1959, and is the second highest dollar volume on record. I see nothing to lead me to think there will be a continuation of the slightly downward trend. On the contrary, I believe this trend will be reversed."

#### MONEY

A greater money supply, increased credit, and for the most part stable interest rates are the components of the 1961 money picture, according to the best available sources.

Economists expect interest rates to remain relatively stable this year. This is the thinking of an overwhelming majority of 327 economists polled by F. W. Dodge, construction statisticians.

The median estimates for June, 1961, were pegged at 3.2 per cent. A slight rise to 3.4 per cent is anticipated for December.

Adding significance to these estimates is the fact that the range of difference is rather narrow. For December of this year, for example, the middle 50 per cent range of estimates extends from 3.0 to 3.6 per cent.

The Federal Reserve policy of recent months has been guided by the objective of making adequate credit available. As a result, there has been a considerable improvement in the reserve portions of commercial bonds and the privately held money supply. After a tendency to contract early in 1960, the money supply was expanding late in the year. Recent Federal Reserve directives to member banks can be expected to produce about \$1.3 billion in new reserves.

#### LABOR

In the year ahead, construction labor will gear its pay demands to the general economic situation, but the emphasis will continue to be in the area of fringe benefits rather than direct pay raises—unless inflationary pressures not now apparent seriously reduce the value of the dollar.

That's the opinion of Cornelius J. Haggerty, president of the AFL-CIO Building Trades Department, as ex-

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**2. Save wear and tear on loading equipment...** Loading ripped material is far easier on your scraper, loader or dozer. You'll get months, even years, of extra service life and save costly downtime and repairs.

**3. Eliminate costly shooting and pavement breaking...** Rugged ATECO rippers will penetrate, rip and fracture rock, shale, cemented gravel, caliche, hardpan, sandstone, asphalt, non-reinforced concrete—and do it at a fraction of the cost of shooting, drop-ball or pavement breaker operation.

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pressed in a special interview given a CONTRACTORS AND ENGINEERS staffer for this roundup.

Over all—under the influence of the growing trend to long-term agreements and larger bargaining units—the labor picture is one of continuing upward pressure, but on a reasonably clearly defined and moderate line.



C. J. Haggerty  
Emphasis on fringe benefits

On another front, Mr. Haggerty adds, there's good prospect for continuing lessening of jurisdictional bickering, particularly in the area of the construction of missile bases, as realization of the urgency of the program filters down to the workmen.

#### EQUIPMENT

For the outlook insofar as equipment is concerned, CONTRACTORS AND ENGINEERS went straight to the source—the companies that manufacture the machinery and materials used in highway, heavy, and building construction. Presidents and other top executives of a representative cross section of manufacturing firms were interviewed for their educated expectations as to the equipment market for 1961, prices, and inventories.

Extreme caution was the unmistakable theme of predictions for the year's equipment sales, an attitude based no doubt on the fact that what one spokesman called the "paper optimism" of early 1959 and 1960 forecasts misled manufacturers into overproduction, overbudgeting of expenditures, and subsequently unfulfilled hopes for increased sales.

The consensus was that there will be a slight improvement in the market for construction equipment this year, but not before the second quarter and more probably not until after the midyear point.

Some rise in prices of new equipment seemed inevitable to the manufacturers queried, but most added that these would be limited to 5 per cent and would be very selective. Increased cost of labor, raw material, and components, as well as higher taxes, were listed as factors that will force the prices a little higher. But the industry spokesmen voiced awareness of the fact that "contractors can't stand much in the way of increases," and therefore indicated that increases will come about only when absolutely necessary.

Several manufacturers admitted that their inventories of new equip-

ment were uncomfortably high as they faced the new year, while others reported that efforts to bring inventories down to a more realistic margin during 1960 have been successful.

CONTRACTORS AND ENGINEERS also interviewed H. A. Radzikowski, chief of the division of development of the Bureau of Public Roads, for his views on future uses of and developments in machinery and materials. He pinpointed these six areas in which contractors could expect developments:

1. Greater use of "end-result" specifications by state highway departments, leaving the contractor more freedom in his choice of methods and machines.
2. Increasing use of automatic

controls on construction machinery.

3. Greater utilization of the potential of machines that have been developed through removal of traditional requirements—such as transfer time in concrete mixing—that dictate speed of work and machines.

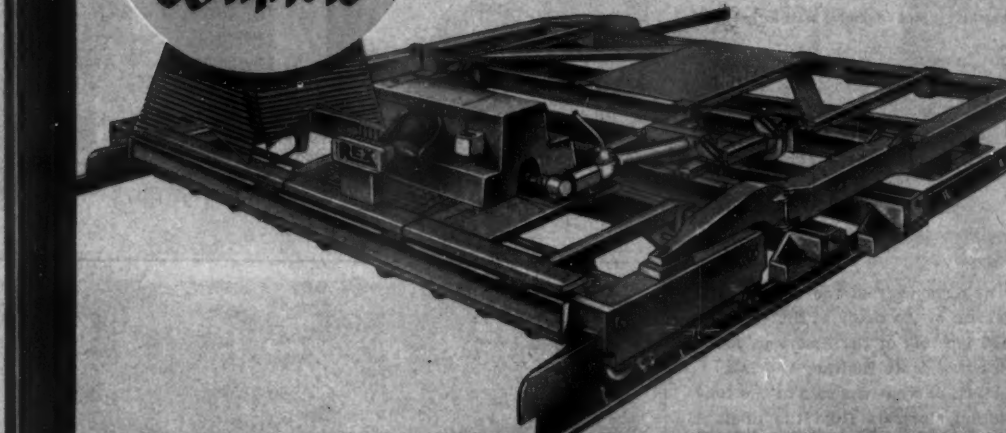
4. Improved methods of testing materials, including infra-red and nuclear devices.

5. Increased use of rippers instead of blasting to remove rock. Here again, better testing and exploratory devices are of great importance.

6. Greater attention to compaction requirements and methods, indicating greater use of vibratory equipment, high-pressure pneumatic tires, and the like.

THE END

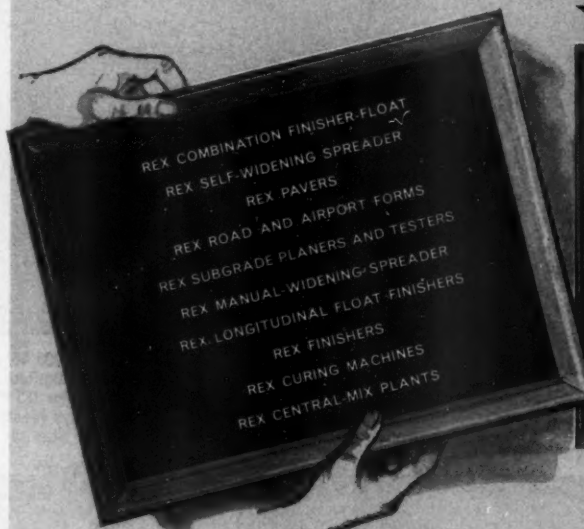
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H. A. Radzikowski  
Six developments to watch

More problems  
than solutions

## At AASHO's 46th

Contractors and Engineers staff article

Dwight H. Bray, 1961 president of AASHO, addresses the general session of the annual meeting last month in Detroit from a one-sided speakers' table. With both Congressmen John A. Blatnik and Gordon H. Scherer absent, Bray and, at right, Bertram D. Tallamy, Federal Highway Administrator; R. R. Bartelsmeyer, past president; and Rex Whitton, Missouri State Highway Commission, carry on the battle.



The dishonesty of the few was the concern of the many at the 46th annual meeting of the American Association of State Highway Officials.

Much of what was said at the convention stemmed from the findings of the Congressional investigations of several state highway departments. The findings of Rep. Blatnik have prompted the U. S. Bureau of Public Roads to maintain closer control over the construction of federal-aid highways. Closer control has caused more friction between the bureau and the individual highway departments. Tighter controls have resulted in more frequent and more stringent field inspections.

Seeing the blemishes exposed by the Blatnik committee, many highway departments are taking a critical look at their own operations. Some departments are revising procedures to insure honesty.

In view of all the bad publicity stirred up by the investigations, many highway bosses are looking with hopeful eyes to their own newly created public-information departments. They hoped that their PI men could get across to the public the predominantly good news of interstate highway construction.

The Association's annual meeting, held in Detroit, November 28 to December 2, attracted some 2,000 delegates. The highway departments of the fifty states, the District of Columbia, and Puerto Rico were represented by 524 members. The strong contingent from the Bureau of Public Roads numbered 121.

As usual, committee meetings dominated the proceedings of the convention. Thirty-seven seat-numbing committee meetings were held in contrast to only two general sessions. On Wednesday, the delegates were allowed a brief respite from smoke-filled rooms as they toured Detroit freeways and made a visit to several automobile assembly plants and proving grounds.

### The man who wasn't there

The convention got off to a good start with the absence of the Hon. John A. Blatnik, chairman of the House Subcommittee Investigating the Federal Highway Program. When announcing Rep. Blatnik's inability to give his scheduled address, John C. Mackie, Michigan's state highway commissioner, jokingly said (in effect) that although he regretted that



"Best rigs for my money—they're doing an excellent job," says R. E. Robertson, superintendent of excavation for Montag-Halvorsen-McLaughlin & Associates on the John Day Lock and Dam project near The Dalles, Oregon. He's talking about his seven DW20Gs with Athey PW20 Wagons, carrying

112,000 lb. shot rock or glacial gravel. Five of the DW20Gs stockpiled 100,000 cu. yd. in three weeks. Day after day they make 185 three-mile round trips, pulling big loads at 32 MP. Says Master Mechanic Huey Long, "These DW20Gs are here to stay on the job."



"These DW20Gs are really hauling sons-o-guns. We've got over 600 hours (in just two months) on them and they're doing great. And this SynchroTouch is undoubtedly the coming thing—only it's here now." This is the way R. A. Heintz describes the five DW20Gs with 432B Scrapers on Heintz & Rogers' railroad relocation project around Ice Harbor Lock and Dam in Walla

County, Washington. The tractor-scraper handles belt-loading and push-loading tasks. The versatility of the tractor-scraper has been augmented by sideboarding for easy top loading. Hauling 25 yards of bank run gravel, the DW20Gs move 240 loads every eight hours, cycling in four minutes on the ¾-mile haul.



R. P. McKenrick, executive vice president, CIMA, tells the construction committee about new developments in construction machinery.



Rep. George H. Fallon, (D. Md.), chairman of the Subcommittee on Roads, backs holding to the 1956 road schedule.



M. Clare Miller, AGC's president-elect, addresses the Committee on Construction. His emphasis is on quality with maximum economy.

Rep. Blatnik would not be able to address this convention, those of Michigan would just as soon that he postponed indefinitely his visit to this state.

Actually, three official reasons were put forward to excuse his absence: illness in family, busy with constituents, busy preparing for upcoming hearings.

Rep. Blatnik was not the only absentee. Because of illness, Gordon H. Scherer, member of the House Subcommittee on Roads, could not speak at the first general session.

#### Watch out for the bureau

David H. Stevens, the association's president, was very much in evidence, however. In his speech in the opening session, he took a look ahead at the future of the national highway program. He concluded that "the need for completion of the Interstate System by the target date of 1972 is still present and that financing will undoubtedly be authorized. The details as to how will be worked out by the Congress only after a great deal of discussion and controversy."

Stevens warned, "The federal-state relationship which has existed for 44 years is definitely threatened by (1) the trend towards centralization in the federal government, (2) the very size of the national highway program, and (3) improper practices on the part of some of the states. Whether or not the traditional federal-state relationship in the highway field will continue to exist will depend upon whether or not the states are capable of demonstrating that they have the ability, honesty, and integrity to meet the criticism which will be leveled against the program."

#### Money solves all problems

Rep. George H. Fallon (D. Md.), chairman of the House Subcommittee on Roads, voiced considerable concern about the money that would be necessary to finance the national highway program. "If we can be successful in putting the federal-aid highway program on a sound financial footing, I am confident that we will not have too much trouble in arriving at satisfactory solutions to the other problems that perplex us."

Rep. Fallon is "in favor of adhering strictly to the construction schedule which was contemplated in the Highway Act of 1956. To complete the interstate program on schedule, it will be necessary to increase the annual federal authorizations from the present level of \$2.2 billion to about \$3.5 billion. This, together with an annual ABC authorization of \$1 billion, would result in annual federal highway expenditures of about \$4.5 billion."

In the construction committee meetings, considerable emphasis was placed on quality control: how to get quality construction 100 per cent of the time and how to catch the few cheaters before they get national publicity. In working toward this goal, AASHTO has been busy over the past year on a set of recommendations on administration and inspection procedures that will insure honest con-

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Look at the big jobs—where high, continuous production is a must! John Day Lock and Dam: 3,700,000 yards—Cat DW20G Tractors with Athey PW20 Wagons for prime movers. Railroad relocation for Ice Harbor Lock and Dam: 6,500,000 yards—another Cat DW20G-482B Tractor-Scraper job.

Put this versatile, dependable DW20G on your job and watch its top performance on all conditions, month after month! Its 345 HP (maximum output) Cat Diesel Engine quickly speeds it to top 35.8 MPH, cutting precious seconds from cycle time. Big power takes it up grades fast, keeping production on schedule. With interchangeable 27 cu. yd. (heaped) Cat 456B or 34 cu. yd. (heaped) 482B Scrapers or 40-ton PW20 Wagons (built by Athey Products Corporation), it loads fast—hauls fast—dumps fast. See your Caterpillar Dealer for on-the-job proof of this versatile, dependable DW20G.

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(Continued from preceding page)

struction work. This guide, a compilation of seven subcommittee reports, will soon be available to state highway departments.

Said D. H. Bray, 1961 president of AASHO, "The committee findings have indicated a probable need, in some cases, for more and better-trained inspection personnel on certain types of construction; but the principal recommendation has been that more checks and cross-checks were necessary to be certain to detect either incompetence or dishonesty on the part of any concerned personnel at all administrative levels."

#### A contractor speaks up

At the construction meeting, a prominent contractor was permitted to air his views on quality management of highway construction. M. Clare Miller, vice president, Associated General Contractors of America, Inc., said that, contrary to what some highway engineers may think, contractors also are very much concerned about building high-standard roads.

In considering guide lines for quality control of construction, Miller asked highway officials to "zealously guard against the possibility of any limitations on production. . . . We well realize that our increased production rates in all fields have created a very formidable problem in your accomplishment of inspection and testing requirements. However, we cannot escape the known certainty that the tail would be wagging the dog, if production is reduced to fit testing procedures, rather than testing procedures expedited to fit production."

Miller also made a few polite suggestions regarding field inspection. He felt there was a need for better, more experienced field inspectors—men with comprehensive understanding of end-result requirements. He believed that specifications should include basic tolerances, "and these tolerances should be the maximum that will still retain the optimum in both quality and economy." (This plea was answered, on paper at least, by M. J. Snider, engineer of construction, Missouri State Highway Commission in his speech entitled, "Reasonable Specification Tolerance For Materials and for Completed Acceptable Construction.")

#### The friendly feud

Although most delegates were smiling as they walked the corridors between committee meetings, it was fairly obvious that all was not well between the Bureau of Public Roads and the individual highway departments. The departments were learning that with federal money comes federal control.

Under pressure from the recent highway scandals, the bureau is looking over the highway department's shoulder a little more closely. As per the bureau's memorandum of 20/5/60, it now requires more documentation of field tests made by state highway inspectors on federal-aid highways.

BPR engineers now make thickness measurements themselves in periodic checks to make sure the contractor is meeting the spec, and to make sure the state highway department is enforcing them.

Ellis L. Armstrong, Commissioner of Public Roads (now head of Better Highways Information Foundation), explored the changing relationship between the bureau and the individual highway departments in a paper presented to the construction committee.

Speaking of the 20/5/60 memorandum, Armstrong said, "There is now good communication between the

state and Public Roads personnel, and variances in interpretation have been and are being clarified. I cannot say that everyone is completely happy and entirely satisfied to operate under the added responsibilities assigned them by the Instructional Memorandum. However, there is no evidence that anyone is shirking those responsibilities, nor has anyone suggested a better method to secure the cross-check which is necessary in highway administration, the same as in any business or undertaking."

#### All is not so well

One highway official who was not

completely happy about the relationship between the federal and state agencies was Fred Quinell, Jr., state highway engineer, Montana State Highway Commission. Although he likes the bureau's men as people, he doesn't think much of their policies.

Said Quinell: "No contention exists as to the right or desirability of the Bureau of Public Roads to maintain over-all coordination on a national level . . . yet there is contention as to the necessity for the extent of their surveillance of the departments through the ever-increasing number of checks and balances to maintain their control. This is a system that is

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"Live-track" Planet Power-steering eliminates load-limiting "dead-track drag!" The TD-25 pushes or pulls the same king-size loads on turn or straightaway! On-the-go Hi-Lo power-shifting ends "gear-shift lag!" The "25" gives you instant, up-or-down matching of power to condition. You turn with the dozer fully loaded, without spillage—do constant contact push-loading applying full power, getting full speed, without mauling the scraper!

Only the "25" gives you the wallop of the International DT-817 engine—230 turbocharged Diesel hp—

to eliminate "slow-motion" lug-downs, even at high altitudes. For full performance under slam-bang conditions, the "25" has the super undercarriage strength of double-box-beam, precision-welded track frames!

No wonder owner after owner reports that 230-hp "25's" outwork king-sized clutch-steered crawlers, up to 50%! Prove to yourself what it means to own the capacity-boosting advantages of full-power momentum—full time, as standard equipment! Let your International Construction Equipment Distributor demonstrate the TD-25!

gradually becoming more restrictive and, in many cases, more and more destructive of the principle of true partnership.

"Another bone of contention is the creeping paralysis that is afflicting the division offices of the bureau. They are the field offices, in close and knowledgeable contact with the situations that exist within the area of their jurisdiction. And yet they have been rendered impotent . . . by the endless rules, regulations, guide lines, policies, and procedures, etc., etc."

#### Good news is hard to sell

The good attendance at the two

committee meetings on public information indicated the increasing prestige of this comparative newcomer to the highway field.

At the second meeting, Robert M. Monahan, special assistant to the Federal Highway Administrator, described in detail the series of prejudiced news pieces—hatchet jobs—on the federal highway program that have been hitting national magazines. He deplored the authors' lack of objective reporting and suggested that public-information men balance the bad publicity with good publicity.

In another paper, Erskine Stewart reported on the progress of the re-



Rex Whitton, left, receives the Thomas H. MacDonald Award for outstanding service in highway engineering from A. E. Johnson. Whitton is chief engineer for the Missouri State Highway Commission.

## momentum **FULL-TIME** TD-25 performance!

Boost the benching capacity of clutch-steered crawlers 100-hp bigger! Simply shift the TD-25's bank-side track to high range—the outside track to low—for full-bite benching. No "bank-nosing"—no sluing—no "lever-fighting." The planet-drive "25" keeps itself "on course"!

This TD-25 removes over 60% more overburden for a quarry man than his formerly-owned king-size clutch-steered crawler. Reasons: full-time "live-track" Planet Power-steering ends load-spilling "dead-track drag"—and the TD-25's high reverse of 7.5 mph cuts his dozer cycle time by more than 10%!

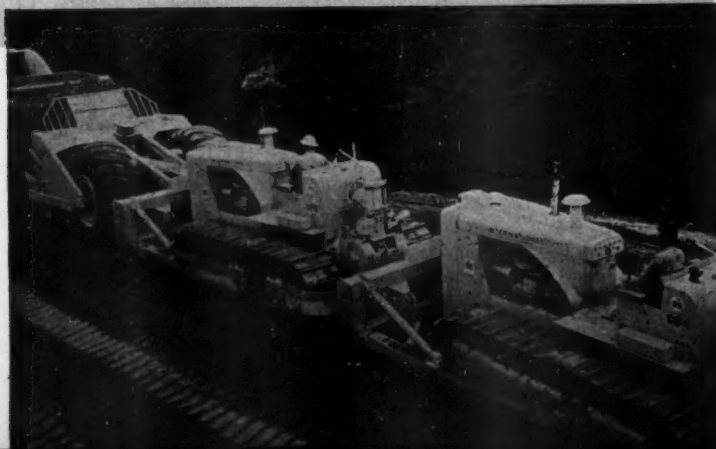


With on-the-go Hi-Lo power-shifting, you shift down to dig hard materials—shift up to "run" with the load. Hi-Lo power-shifting makes the TD-25 the industry's only 4-speed torque-converter crawler, and the only one with load-matching efficiency-range control. Only simplified TD-25 planetary design is engineered and located to give you "live-track" power-steering and on-the-go power-shifting!



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You speed up all four steps of the push-loading cycle with the torque-converter TD-25. (1) You power-shift down and use decelerator to get better-tough contact; (2) power-shift either track up or down to keep solid push-block contact on curves; (3) power-shift up, on-the-go, for gear-higher kick-outs; (4) with 7.5 mph reverse, reposition faster than other rigs!

cently organized Better Highways Information Foundation. Stewart, the foundation's vice president and treasurer, said that "the initial effort of the foundation was production of a brochure entitled, 'Why We Need Better Highways Now.' More than half a million copies of this piece have been placed in circulation, and orders for it are still being filled."

Stewart reported further progress: "The first major distribution of program material began last week with a kit containing speeches, editorial fact sheets, radio-TV scripts, feature articles, and an abundance of other materials. . . .

"Beyond this, the following materials are in various stages of development: a motion picture; TV film strips; at least two more widely informative brochures on our highway needs; traveling exhibits for use at fairs, conventions, large meetings, and other occasions; posters that might be used for smaller meetings; window displays; car cards; etc."

#### New equipment

R. P. McKenrick, executive vice president of the Construction Industry Manufacturers Association, reported to the construction committee on new developments in construction machinery. In the field of compaction, he spoke of a vibrating sheep-foot roller that had special compactive advantages.

Automatic grade control for bituminous pavers has been successfully tested. On this machine, a sensing device works off a single wire reference and activates screed-adjusting electric motors. Also recently developed is automatic grade line control for concrete slip-form pavers.

Rex M. Whitton, chief engineer for the Missouri State Highway Commission, was awarded the Thomas H. MacDonald Award for outstanding service in highway engineering.

#### New officers

Dwight H. Bray, chief engineer of the Kentucky Department of Highways, was elected president of AASHTO to succeed David H. Stevens, chairman of the Maine State Highway Commission. The first vice president for the coming year is J. C. Womack, California state highway engineer. Womack will become president at the end of the next annual convention, which will be held in Denver.

THE END

For more facts, use Request Card at page 18 and circle No. 276

## Job preplanning — staff or field function?



by **GEORGE E. DEATHERAGE, P. E.**  
construction consultant

Contractors have a lot to learn about good management.

It has been estimated that more than one-quarter of the nation's construction firms finish up the year in the loss column. An uncounted but no doubt alarmingly large number fail each year.

And a Dun & Bradstreet analysis of business bankruptcies in general reveals that about 85 per cent are due

to lack of management knowledge and unbalanced management experience.

### Failures widespread

In the United States alone, there are some 476,000 contractors and subcontractors. Each year, some 60,000 new firms enter the business while some 43,000 drop out.

The record is similar in Canada where, in 1957, the Canadian Tax Division of the Department of National Revenue revealed that, out of 7,521 construction concerns reporting, 2,088, or 27.7 per cent, were in the loss column at the end of the year. While there are no comparable figures for the United States, authorities feel there is little reason to doubt that the Canadian percentage of failures applies to this country. A few authorities even conclude that the percentage for the United States may be higher.

Using this as a basis for projecting losses for U. S. contractors, about 131,852 of the 476,000 contractors and subcontractors here lose money even in a good year.

In Canada, the statistics have worked to bring about agitation among surety companies to double or triple bond premiums. Contractors counter with the charge that the surety is greatly to blame by bonding the inexperienced and incapable firms, causing unhealthy competition.

### Role of management

Efficient contractors, out to earn a modest profit, have much justification for their complaints about the novice who operates on an unsound basis. The sound contractor has to meet this competition and make a profit to stay in business or else go without work.

But only by good management, which holds a tight rein on every cost involved in a job and which makes possible low bids assured of a profit, can healthy competition hope to hold its own.

Inefficient management—both of irresponsible novice firms that pay bids at unreasonable lows and of firms attempting to compete in these days of slim profit margins—is one of the biggest causes of nonprofit jobs and failures.

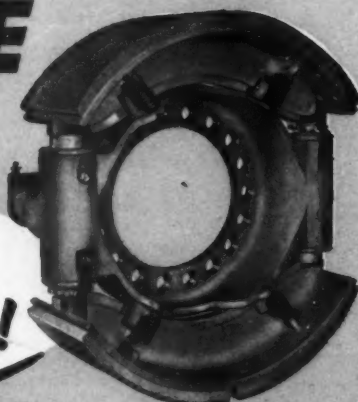
In great part, the construction industry itself is to blame for the lack of good management. For the most part, contractors and their associations have not greatly interested themselves in promoting sound construction management by organizing and conducting management seminars, cost and work-methods discussion groups, or employee training programs.

In this, they are lagging far behind the manufacturing and processing

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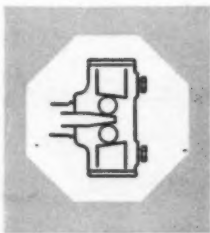


To meet the growing need for more versatile, more compact, more dependable braking equipment in off-highway operations, Rockwell-Standard® now presents a completely new concept in brake design.

This new brake is specifically engineered for use on scrapers, prime movers, earth and rock wagons, dump trucks and similar construction vehicles. Available in 17, 20¼, 22 and 26-inch diameters and in 4 to 10-inch widths.

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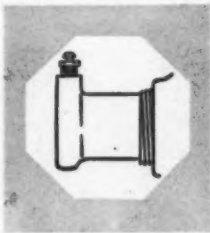


### Only the Heavy-Duty Stopmaster offers:

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Results in improved braking performance and lower operating temperatures. In Dual-Actuation design, both shoes do an equal amount of work. Balanced shoe-action assures more dependable service; faster, surer stops.



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*This is the first in a series of articles by George E. Deatherage, P.E., construction management consultant. The articles are offered to encourage and assist contractors in applying modern industrial business methods to their own particular problems in management. This series is an extension and continuation of a basic construction management course that was completed with the December, 1960, issue of CONTRACTORS AND ENGINEERS.*

industries, which have developed the science of industrial engineering or methods engineering to a high degree. This system enables them to predetermine the one best method to use for specific work, and to check field costs that are out of line and put the finger on the factors that are causing them.

It will be the purpose of this new series to show how these preplanning methods can profitably be adapted to the construction industry—how, in other words, contractors may determine the best field work methods to be used before the work is actually begun.

#### Contrast in work

There are many jobs—large ones such as dams, bridges, and other heavy engineering construction—where the nature and extent of the work demand a thorough study of methods, plant, and equipment before any sane bid is possible. On this type of job, labor is probably the minor item; the plant and equipment generally make up 60 to 80 per cent of the fabrication and erection costs. These jobs, however, are in the minority.

On these larger jobs, the nature of the work and the fact that it has fewer work classifications—though each classification involves greater quantity or repetition of a particular kind of work—make job preplanning unavoidable. A structure such as a modern office building, with its necessary finishing trades, has many work classifications, which require a smaller quantity of a particular kind of work.

#### Basis of profit

Developing and using the best field-work methods in order to secure the highest production and the lowest possible costs should be the aim of every contractor, for this is the foundation on which profitable jobs are built.

#### Begin with the estimator

Before the estimator can determine a unit cost he must have a mental picture of how the work is to be done in the field. He must know what methods, men, and machines will be used and what production can be expected from them.

Often he will merely draw on his previous experience for this preplanning. Depending on the size and type of project, he may or may not have to make a thorough study of factors peculiar to this job. If such a study seems advisable, he will probably not be required to work alone in arriving at his conclusions.

The contractor or some governing authority may, if the job is important enough, look over the plans and pre-

determine the major work methods to be used. The estimator may then be instructed in some detail, depending on the organization of the firm, the man in charge, the reliance he places on the estimator, etc.

Another factor is the time available

for the contract letting. The estimator often has to prepare 10 or 15 bids before a contract is secured, and this naturally limits the time available for detailed preplanning.

Prebid planning is a staff function. In many organizations the man

who will run the job is called in for consultation, but in many others he is ignored. In some companies the man who heads up the estimating and bidding will himself take charge of the field operations.

(Continued on next page)

## How 4-in-1 Fleet Owners cash in on "MULTI-MACHINE" utility...



**8-unit owner, Lark Shrader, Los Gatos, California,** credits much of his business success to 4-in-1's. "My competition uses ordinary limited purpose tractor loaders, while our International Drott 4-in-1's can do almost anything," states Mr. Shrader. "We charge more per hour, and have a customer waiting list!" Here one of Mr. Shrader's TD-9 rigs shows exclusive 4-in-1 clam-action bottom-dumping, that eliminates the sticky materials problem!



**7-unit owner, Riemer Brothers, Inc., Schiller Park, Illinois,** handle sizeable contracts over the midwest with International Drott 4-in-1's. Says President George Riemer: "Each dollar we have invested in 4-in-1's does the work of several dollars in 'big-ticket' machines to do all a 4-in-1 does—ably and profitably!" Riemer Brothers save up to 90% on hand labor cost on fine grading work—with 4-in-1 "carry-type scraper" working accuracy!

**3-unit owner, Zachary & Brown, Abilene, Texas,** bank on International Drott 4-in-1 capacity and versatility for speeding construction of Atlas Missile silos. After "shooting" loose a 5-foot depth of rock, contractor lowers a TD-9 Four-in-One into the hole—to dig and load the material into a big dragline bucket. The circular holes are dug 56 feet in diameter, 180 feet deep. Contractor can "clam-handle" big rocks; bulldoze; grade; apply "power-shovel-like" break-out force—only with the 4-in-1's!



**Who better than fleet owners** would know what it means to command International Drott 4-in-1 "equipment fleet" performance. Compare for yourself the big advantages of getting the built-in utility of bulldozer, clamshell, excavator-loader, and "carry-type scraper"—in one machine, one-man-operated! Let your International Drott Distributor demonstrate!

International Harvester Company, Chicago 1, Illinois  
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# INTERNATIONAL DROTT

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(Continued from preceding page)

In the prebidding stage, all job preplanning by the estimator may—if the contractor is the type to do so—be shot to pieces by last-minute bid shopping, making blanket cuts to get under the competition, loading some items and cutting others beyond the point of reason, or any of the other unethical practices contractors may use to get a job—or to insure that the organization is kept busy.

Irrespective of the nature and scope of the job, preplanning never leads to work-method plans that are subject to mathematical proof. The conclusions reached are most often based on determinations founded on past experience and assumed to be right for the job at hand.

#### Job preplanning

Let us assume that our contractor is the low bidder and the job is his. The next step is the practical and immediate job preplanning—selecting the actual work methods and equipment to be used in the field.

Here general practice varies. In some cases the entire responsibility is placed with the superintendent or project manager, and he is expected to arrive at major decisions with the help of the contractor or other higher authority. In other cases, the more modern, functional approach is followed: utilizing the service of the methods engineer and his staff.

Only the larger concerns, of course, can afford to employ this last-named technique of proven industrial engineering. In such a case, an industrial

or methods engineer is employed at the contractor's main office on the staff level. He assists in the job preplanning at the estimating and bidding stage. And he will support his conclusions with the necessary process charts and cost data.

When the job is secured, the methods engineer immediately starts the actual job preplanning, making his equipment layouts if needed and selecting the work methods. As he now has more time on his hands, he can and will spend more of it in considering various alternative methods.

Before any work is started in the field, this data is passed on to the superintendent or project manager as a general guide which he is expected to follow.

At the same time, the superintendent

For more facts in insert, use Request Card at page 18 and circle No. 280

ent or project manager is supplied with a field man who acts as the "methods engineer," following the general approved work methods, but consulting with the superintendent or project manager before they are put into effect. In the final analysis, the selected work methods are the result of a joint cooperative agreement between the top field man and the "methods engineer." The mechanics of this cooperative effort will be the subject of future articles.

Assuming that the contractor has the materials and subcontract situation in hand in accordance with his estimate, the success of the job revolves about performing the fabrication and erection in the most efficient manner possible.

#### Paper work

The above requirement, if it be successful, means selecting the right work methods, plant, and equipment before the work is started in the field. This means building up the plans of several of the alternative methods and selecting the best one on paper before the work is started. The alternative is to guess at the best possible method and hope that it is correct. If it fails, it is generally too late, moneywise, to make a change.

The use of the industrial engineering technique—of methods engineering or "work simplification" techniques—to properly select the one best method (and prove it mathematically on paper before the work is started) means more paper work, which the average contractor hates. But what is the alternative? Nothing except trial and error—a costly process.

To consider, then: Should this final job preplanning and selection of work methods be done at the staff level, in the main office, or in the field? Or should it be a cooperative effort and function?

Experience seems to force the conclusion that complete centralization for the methods selection at the main office is not practical. Job conditions are variable and subject to change in innumerable ways. Weather conditions are not static; neither are working conditions, the availability and performance of equipment and manpower, and other things too numerous to mention.

Practically, therefore, the final functions must be decentralized and the final decisions made on the job. True, the general over-all job preplanning should be followed, but subject to adjustments on the job.

Now, if this modern practice is to be followed, it should be available to the small organization as well as the large one. It should work as well with the one-man organization as with the large corporation. This simple technique of the selection of proper work methods should be the tool of every man in the organization from the foreman level and above.

(Next month's article will deal with "Simple Mechanics and Methods Engineering.")



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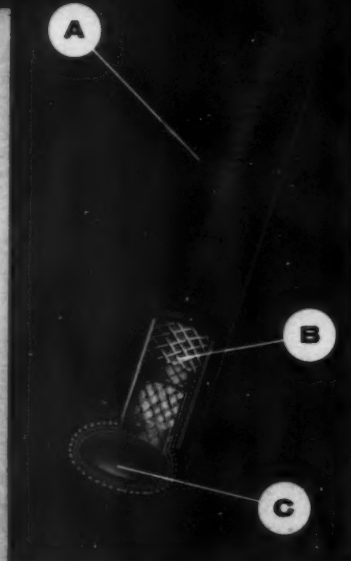
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## WRI offers free bulletin on reinforcing pavement

The Wire Reinforcement Institute is offering, free of charge, a bulletin entitled "Machine Placement of Wire Mesh Reinforcement in Single-Lift Concrete Pavement," by Glenn S. Paxton, assistant state highway engineer in Oregon.

The 11-page illustrated booklet, which was published earlier this year by the American Road Builders' Association, was first presented as a paper at ARBA's 58th annual convention in Chicago. It describes the construction of a section of Interstate 5, south of Albany, Ore., on which the contractor used a machine which he designed to place the wire-fabric reinforcement in a single lift of concrete.

After the paver spread the 8-inch thickness of concrete, the machine was used to vibrate and push the mesh down to its specified position, 2½ inches under the surface. The machine also placed the dowels for the contraction joints. The rate of progress on the project was one-third greater than on jobs where the lower course is struck off for placement of reinforcement.

Copies may be obtained by writing to Dept. 246, Wire Reinforcement Institute, National Press Bldg., Washington 4, D. C. Requests should be made on your firm's letterhead.



BACKFILLING FOR A WATER MAIN in Orlando, Fla., is handled by a Model H-50 Payloader for Harold Pickens & Sons, prime contractor for approximately 20 miles of the main. Material excavated is "sugar sand," requiring a 30-inch-deep cover for the pipe. Galvanized-pipe sizes vary from ¾ inch to 2 inches; cast-iron pipe from 6 to 16 inches.

## Testing engineers meet

The New York, New Jersey, and New England States Testing Engineers Association, designed to give members a share in the solution of common problems that beset engineering and construction in the area, held its 36th annual meeting last month in Boston. Membership in the association, which operates without dues or fees, is composed of state and local public-works people, contractors, equipment and materials producers, consultants, and commercial testing laboratories.

High points of the meeting included a symposium on recent asphalt construction problems, with L. K. Murphy of The Asphalt Institute as moderator; a discussion by Bureau of Public Roads people on its new directive; and talks on testing equipment, by M. D. Morris of New York and on compaction by W. P. Hoffman, director of the New York State Bureau of Soil Mechanics.

Also on the agenda were presentations on "Reinforced-concrete Culverts," by the American Concrete Pipe Association; "Methods of Control Testing Ready-Mix Concrete," by H. Humphrey, PCA; "Uses of Epoxy Resins," by W. Williams of Sika Chemical; and a talk on coatings and paints by C. G. Oertel of the Hercules Powder Co. This year, for the first time, a noncommercial exhibit of new products from eight companies was part of the meeting.

## Travelift & Engineering acquired by Drott

Travelift & Engineering, Inc., Sturgeon Bay, Wis., has been purchased by Drott Mfg. Corp., of Milwaukee and Wausau, Wis.

Travelift manufactures mobile straddle carriers, lifting devices for truck trailers, and other equipment.

Drott produces loading equipment used in construction and road building. It also manufactures a line of mobile boom-type cranes for material handling.

The Travelift operation will be maintained in its present location, as a division of Drott. George Baudhuin, former Travelift president, will be general manager of the new division.



Pit foreman J. Steinmetz says, "You can't buy better portable equipment."

Oregon Stone Quarries works 3 to 4 pit locations per season using their 24 x 36 Lippmann portable primary... reports 200 tph output at 75 to 80% crushing, producing minus 4" stone. After 4 years' operation they report, "No maintenance required."

## WHY LIPPMANN PORTABLES REDUCE COST/TON CRUSHED

Biggest reason is higher rated output per size of jaw crusher—heart of any portable crushing plant. Consider the famous Grizzly-King primary crusher, for example. A comparison of specs will show you that Grizzly-King gives you up to 26% more crushing area, 23% less angle of nip, than other jaw crushers of same size rating. Contoured feed openings, and specially-shaped force-feed jaws, combine to reduce bridging of slabby material and increase material flow. Net result is bonus production and lower net cost per ton.

You'll make additional savings in daily operating costs. Massive counterbalanced flywheel (bigger than on other makes) more effectively stores power for crushing stroke, makes substantial savings in fuel costs. Oversize bearing assemblies, with removable retainer ring for easy field servicing, keeps repair and downtime costs to a minimum.

Lippmann's low travel height, and excellent weight distribution on special springs and axles, let you travel from job to job with a minimum re-routing or permit problems. Let you set up with minimum jacking and blocking since Grizzly-King crushers do not transmit excessive power robbing vibrations to substructures.

Before you invest in a portable, check all the facts on Lippmann portables. See for yourself why Lippmann owners say: "You can't buy better portable equipment."

**LIPPMANN**  
ENGINEERING WORKS, INC.  
MILWAUKEE 14, WISCONSIN

PORTABLE ☐ primary & dual crushers  
☐ washers, screening plants  
☐ conveyors, hoppers, feeders

For more facts, use Request Card at page 18 and circle No. 281



Owner Al Sells says, "When we're ready for another primary, you can bet it'll be a Lippmann."

Sells Bros. Stone & Gravel uses their 24 x 36 Lippmann portable at scattered pits in East-Central Wisconsin. Here, they average 150 tph with 95-100% reduction of blasted limestone, producing minus ¾" materials. At another location they reported 200 tph at 70% reduction.

### CLIP AND MAIL FOR FACTS... ADDRESS TO

**LIPPMANN ENGINEERING WORKS, INC.**  
Milwaukee 14, Wisconsin

Yes, send details on how I can cut costs on my portable crushing.  
I'm interested in crushing plants: dual ☐ primary ☐  
conveyors ☐ washers ☐ screening plants ☐  
hoppers ☐ feeders ☐

Name ..... Title .....

Company .....

Address .....

City ..... Zone ..... State .....

LP-1-61



Contractor working  
on military field uses

## Concrete spreading

Three Koehring pavers lead this train working on a new taxiway at Andrews Air Force Base in Maryland. Two and 3-paver spreads—and occasional use of a one-paver train in odd areas—made paving highly efficient.

By using two paving spreads—one with three pavers and one with two—and building a single-paver spread for handling other areas as needed, a contractor made an efficient job of paving a runway, taxiways, and aprons at Andrews Air Force Base in Maryland.

Tightly knit paving and batching



Ahead of the paving spreads, equipment was busy working on the subgrade. This Buffalo-Springfield 10-ton pneumatic roller handles compaction.



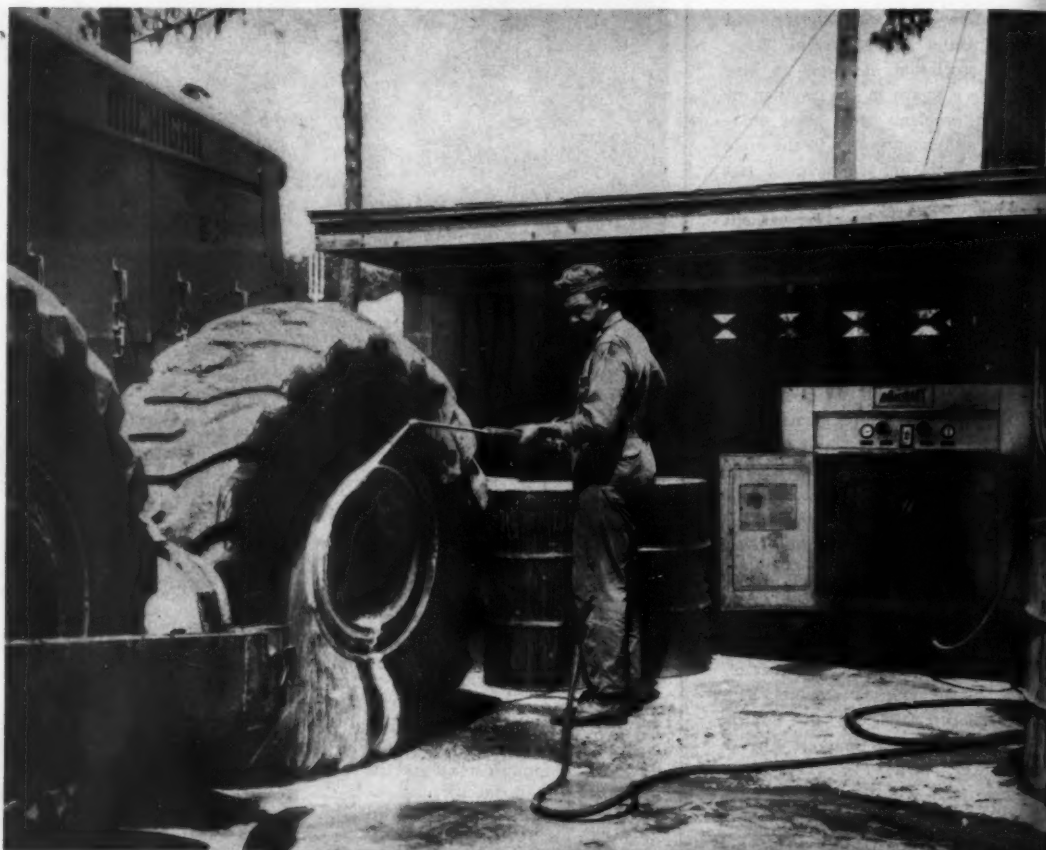
Additional compaction is provided by a Lima Roadpacker vibratory compactor as it travels over the subgrade next to a lane being paved.



This Cat 12 grader uses Roadgrader Gauge blade extensions and the new crown-adjusting moldboard. Blade extensions rest on the side forms.



A Michigan 2-yard loader is used to bring in material for final grading work that is done just before the concrete paving train comes along.



"It used to take us a full day to clean a truck or tractor, but now only half a day with our Malsbary 250 HPC—and we get better results besides" says Mr. Faircloth.

Here Mesabi Range user reduced overhaul on 6 1/2-yard shovel from 5 to 8 weeks by cleaning it in the field with a trailer-mounted Malsbary 250 HPC. Stationary Malsbary 250 cleans trucks, tractors and other easily moved equipment at headquarters shop.



## made to order

Contractors and Engineers staff article

operations were a must during this work in the middle of one of the nation's busiest military fields. At Andrews, the old "diamond pattern" of runways is being abandoned—except for the existing north-south runway and taxiways—and the new 10,400 x 200-foot runway, which parallels the existing runway, plus taxiways and aprons, will handle an anticipated increase in air traffic.

### Field updated

The huge airfield now handles over 14,000 flights per month for the Air Force, Military Air Transport Service, Air National Guard, Air Reserves, and special activities that include the

President's big jet liners. Within two years, the field will have additional traffic, since Bolling Air Force Base and the Anacostia Naval Air Station—located just across the Potomac River from the Washington International Airport—will be closed down.

The Washington District of the U. S. Army Corps of Engineers, supervising construction for the Air Force, estimated over 400,000 cubic yards of concrete as being required for the paving of the runways, taxiways, aprons, warm-up areas, and the high-speed turnoffs.

Lane Construction, Meriden, Conn., which held contracts amounting to about \$17 million for this work, equipped the project with a high-capacity batch plant and mechanized paving spreads.

The new runway has concrete end sections 1,000 feet long and 200 feet wide. Connecting the two end sections is a center concrete strip, 88 feet wide, flanked by 56-foot-wide asphaltic-concrete pavements, to maintain the 200-foot width for the full length of the runway.

Seeded shoulders, 100 feet wide, will skirt the edges of the runway, and beyond the ends are 1,000-foot overrun areas, with the inside 250 feet stabilized with asphalt.

The unreinforced-concrete pavements vary in thickness from 14 inches for the 88-foot center runway strip, to 19 inches for the taxiways and high-speed turnoffs. Wherever the transverse taxiways or the turnoffs tie into the runway, the slab is thickened to 19 inches.

The 1,000-foot end sections of the runway have a 17-inch-thick slab for the inside 500 feet and 19-inch thick pavement for the outside 500 feet. Supporting the runway slabs is a 12-inch-thick base course of select material, compacted to 100 per cent of modified AASHTO density, that was processed by a plant set up on the site.

The new 3-inch asphaltic-concrete pavement, laid in two 1½-inch lifts, is supported on a 28-inch flexible subbase and a 6-inch crushed-aggregate base.

### Center joint removed

A design feature of the runway called for the elimination of the longitudinal joint running down the center line of the 88-foot runway strip. The Air Force did not want the center-line joint, since this might prove a hazard if the relatively small wheels of jet fighters tended to follow the joint during high-speed landings and takeoffs.

The result was a design calling for a 16-foot 8-inch-wide crowned strip along the center line of the runway. The remaining runway cross section on each side of this strip falls off on a 1 per cent grade to provide the necessary transverse crown to the runway. The longitudinal slope of the runway has resulted in a grade differential of 29 feet between the north and south ends.

Making up the 88-foot center strip of the runway therefore required adjustment of the paving widths. Flanking the 16-foot 8-inch center line strip are two other 16-foot 8-inch strips and two 19-foot strips.

The 200-foot-wide runway end sections have an additional three lanes, 18 feet 8 inches wide, on each side of the 88-foot center section.

### Paving spreads

The contractor generally used two paving spreads simultaneously—one with three pavers and one with two pavers—to lay the runway and taxiway pavements. Smaller spreads having a single paver were occasionally formed, to fill in odd areas and handle placement for the apron and warm-up slabs. All this required about nine Koehring Twinbatch pavers, which included standby rigs in case of breakdowns.

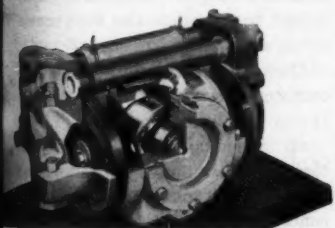
A typical paving train consisted of

## Overall Cleaning Costs Cut 50% with MALS BARY HPC CLEANER

"Cleaning is an indispensable preparatory step to major overhauls.

You have to steam clean before you can find out what to do. Since we got our Malsbary 250 HPC cleaner, we've cut cleaning time in half and overall cleaning costs about 50%," reports Don Faircloth, maintenance superintendent in charge of 140 big rigs for James H. Craggs Const. Co., Gainesville, Florida.

### MALS BARY IS DESIGNED FOR ROUND-THE-CLOCK CLEANING



**THE PUMP**...heart of HPC cleaner. This Model 250 Malsbary-designed, double-diaphragm pump has 5 extra large monel, disc-type check valves for quiet operation and positive volume. No packing glands to replace. Pressure regulator enables operator to vary volume and pressure at cleaning gun to meet work load.

**FUEL SYSTEM**...has no high pressure pump to get out of order. Oil feeds by gravity. The smallest fuel opening is 1/8", so random dirt passes thru easily.

**MALS BARY HEATING COILS**...are double the size used in most steam cleaners. This means less clogging, better water flow, longer periods between descaling.

### WHY HPC?

There's a whole of a difference between ordinary steam cleaning, and cleaning with a Hydraulic Pressure Combination Cleaner—a Malsbary exclusive, patented combination. This difference comes from combining the thermal pressure of a steam cleaner with hydraulic pressure produced by a heavy-duty pump, operating at up to 400 psi. The thermal-hydraulic pressure thus developed produces an explosive, multiple velocity blast that has no equal among cleaners for cutting grease, road oils, caked mud, old paint, etc.

ONLY with HPC do you get this enormously effective blast of atomized cleaning solution particles (soap and hot water) to cut cleaning time and costs—without work hiding fog! And another big difference—it's the only cleaner designed for cleaning big equipment on a 24-hour, 7-days-a-week basis. Try it—see for yourself.

**YOU CAN'T LOSE**...Buy a Malsbary HPC cleaner and try it for 10 days. If it doesn't perform as stated in this ad, return it, and our dealer will refund your money. Call him now, or mail coupon.

### MALS BARY

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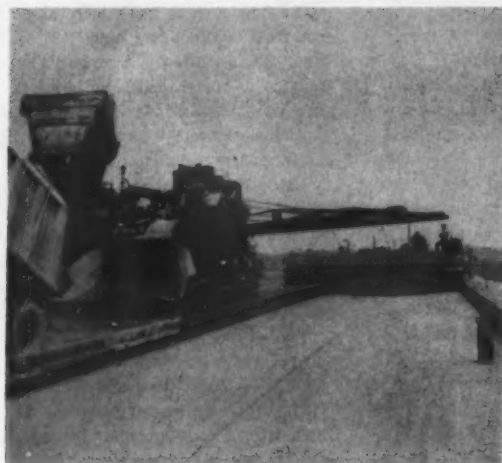
Please send me ☐ folder on Malsbary HPC cleaners; ☐ information on buy-and-try plan.

Name \_\_\_\_\_ Position \_\_\_\_\_

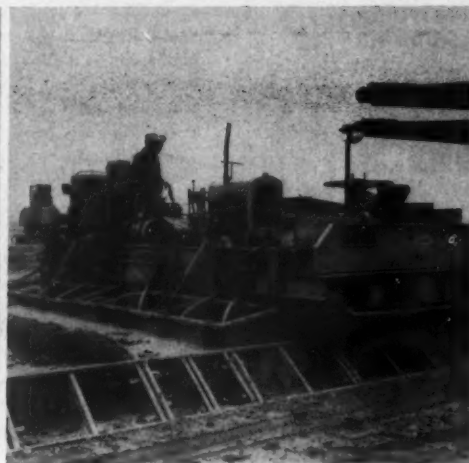
Company \_\_\_\_\_

Address \_\_\_\_\_

For more facts, use coupon or Request Card at page 18 and circle No. 282



Two Koehring pavers dump mix in front of a Blaw-Knox spreader in a typical operation at the base.



The Blaw-Knox spreader works with rear-mounted vibrators that extend to 2 inches above the subgrade.



After the mix has been struck off, a Koehring finishing machine with two transverse screeds comes along.

## “Call FOSTER . . . rent the piling and get savings PLUS”



One sure way to cut costs on your next steel-sheet piling job is to use Foster's Piling Rental Plan. You get savings *plus* the assurance of all the piling you need, when you need it!

Foster's nationwide warehouses and field stocking points carry all standard sections — plus corners, crosses and tees — plus hammers, extractors and other driving accessories — all available for immediate shipment.

Ask for the exact sections, the exact lengths the job requires. All you pay is one low fixed rental rate. No more hazardous and costly driving with substitute “make do” sections; no more tying up cash in big piling inventories.

For all types of piling, for complete stocks of highway and construction products, call the Foster specialist near you. Write **L. B. FOSTER CO.** for Piling Catalog CE-1, Pittsburgh 30, New York 7, Chicago 4, Houston 2, Los Angeles 5, Atlanta 8, Cleveland 35.



## ***Faster From Foster***

Rental Steel-Sheet Piling • Pipe Pile • H-Pile • Lightweight Piling • Pipe • Rail

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(Continued from preceding page)

the pavers; a Blaw-Knox spreader, equipped with rear vibrators set to a point 2 inches above the base course, to spread the full-depth slab pour; a Koehring transverse double-screed finisher; a Koehring longitudinal floating machine; and a joint-planter machine turned out by Middlestadt Engineering to install its patented Unitube metal joints. At the rear of the train were a burlap drag and hand finishers to prepare the slab surface for the spray machine that placed the Hunt compound.

Ahead of the paving spread, steel forms were set, and form stakes were driven with an air hammer powered by a Le Roi Tractair self-propelled compressor. A Caterpillar No. 12 grader, equipped with Roadgrader Gauge blade extensions, handled the fine-grading between the forms as a Michigan 2-yard front-end loader hauled in fill for low spots.

The Roadgrader Gauge blade extensions were equipped with the new adjusting crown moldboard that shaped the subgrade and base course to the required crown slope.

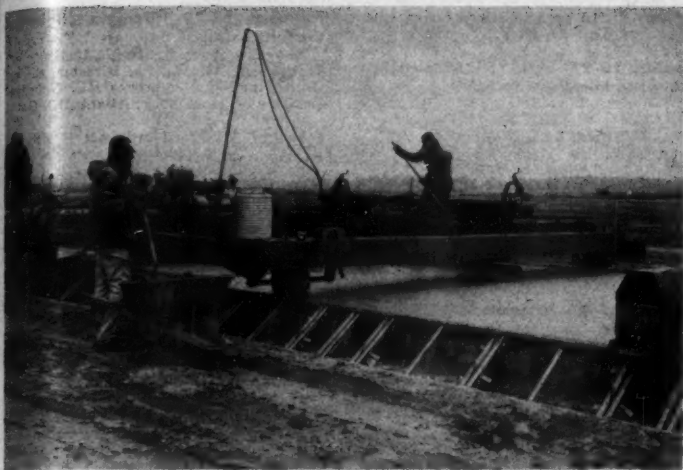
After fine-grading, the base was compacted by a Buffalo-Springfield 10-ton steel-wheel roller.

All the transverse joints were formed by installing Unitubes, spaced from 12½ feet to 25 feet, in the green concrete. These Unitubes, which eliminated joint sawing, were installed by a special rig that first vibrated a metal plate down into the concrete. It was then withdrawn, so that the Unitube could be placed in the slot formed. The metal plate was then lowered over the Unitube and the joint vibrated flush with the slab's surface. Later, the Unitube was crimped at the top, and the void was filled with a jet-fuel-resistant mastic compound. The depth of these joints varied according to the slab thickness and was determined by dividing the slab thickness by six.

The joint depth was adjusted by inserting a metal strip between the bottom flanged lips of the Unitube. The various widths required were formed by clipping Unitube sections

For more facts, use Request Card at page 18 and circle No. 284

CONTRACTORS AND ENGINEERS



Next in line is a Koehring longitudinal floating machine. Just behind it is a joint-planting machine.



A unitube planter, made by Middlestad Engineering, Baltimore, installs transverse-joint formers in the slab.

together before embedding them in the concrete.

The huge batching operation was supplied by three stockpiles—sand, 1-inch stone, and 2-inch stone—formed of aggregates hauled in by trucks. The trucks, riding an embankment, dumped into hoppers that fed conveyors charging the stockpiles.

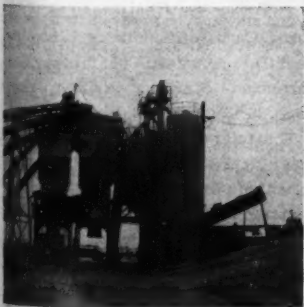
Each of the three stockpiles had a 100-inch-diameter reclaiming tunnel to charge the conveyors feeding the pair of 200-ton 3-compartment aggregate bins of the Noble batch plant.

Cement, delivered to the plant by truck-tankers, was stored in two 5,000-barrel silos. During batching operations, cement was transferred to a pair of cement weigh batchers, located between the silos and bins, and then transferred to the discharge hoppers of the two aggregate bins. This setup made it possible for two batch trucks to be charged simultaneously. In one 10-hour workday, over 3,300 dry batches were turned out by the plant.

Air-entraining agents, Aerolith or Placewel, were added to the mixing water at the pavers. Converted Euclid bottom-dumps supplied the water to the pavers as other converted Euclids made the hauls from the water source.

A. W. Covington is the Southern Maryland Area Engineer, supervising all work on the base, for the Washington District of the Corps of Engineers. Consultants are Whitman, Requardt & Associates, Baltimore, Md.

THE END



Aggregates from three stockpiles are fed to the Noble batch plant by a system of conveyors to charge the two 200-ton 3-compartment aggregate bins. Two cement silos and two intermediate silos make it possible to transfer cement from storage to weigh batcher and to handle single-stop batching for two of the batch trucks at a time.

## problem: raise and set 165-ton, 75-foot sewage reactors

**S**olution: The AMERICAN 200-ton guy derrick at right lifted and placed four of these giant sewage disposal reactors in an average of 45 minutes each. Derrick was equipped with a 160-foot mast, and 110-foot boom; was powered by an AMERICAN Model 250 three drum air controlled hoist.

It's another example how AMERICAN can help you meet *any* lifting requirement... with crawler or rubber-mounted cranes, revolvers, derricks, hoists, or job-tailored equipment.

No other manufacturer offers this broad range of lifting equipment. It means you can look to AMERICAN for *unbiased recommendations* in matching your equipment to your job... big, small, special or routine. Talk over your equipment problems with your AMERICAN distributor. He's a good man to know.

D-201



EXCAVATORS  
1/4 to 4 1/2 yds.

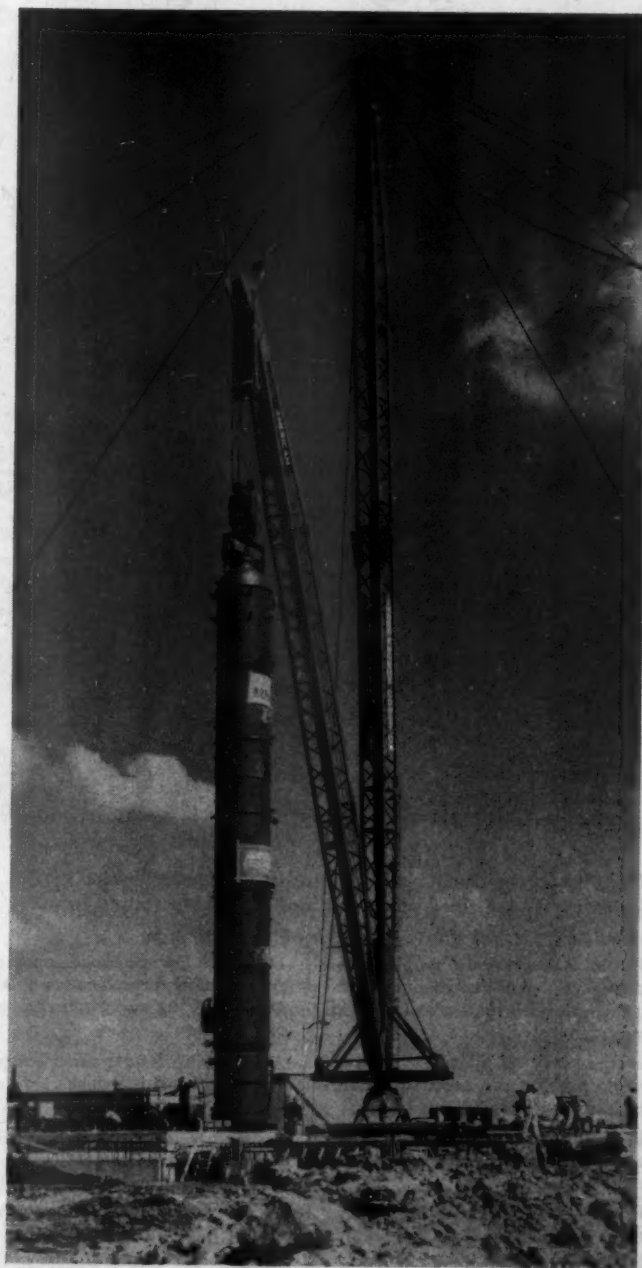
CRANES  
12 1/2 to 110 tons

DERRICKS-HOISTS  
to 800 tons

REVOLVER CRANES  
to 400 tons

FORGED FITTINGS  
FOR WIRE ROPE  
AND CHAIN  
(Crosby-Laughlin Div.)

For more facts, use Request Card at page 16 and circle No. 235



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GINEERS

JANUARY, 1961

## Convention Calendar

### January 9-13 1961 Highway Research Board

Annual meeting, Sheraton Park Hotel, Washington, D. C. Fred Burggraf, director, HRB, 2101 Constitution Ave., Washington 25, D. C.

### January 16-18 Conference for Land and Construction Surveyors

Conference, Pennsylvania State University, University Park, Pa. Continuing Education Conference Center, Pennsylvania State University, University Park, Pa.

### January 17-19 National Limestone Institute

Annual convention, Statler Hilton Hotel, Washington, D. C. Robert M. Koch, president, NLI, 210 H St. N.W., Washington, D. C.

### January 17-20 National Crushed Stone Association

Annual convention, Americana Hotel, Miami Beach, Fla. J. R. Boyd, executive director, NCSA, 1415 Elliot Pl., Washington, D. C.

### January 18-20 National Concrete Contractors Association

Annual convention, Diplomat Hotel, Hollywood, Fla.

### January 21 National Ready Mixed Concrete Association

Annual meeting, Exhibit Division, Americana Hotel, Miami Beach, Fla. V. P. Ahearn, secretary, NRMCA, 1411 K St. N.W., Washington, D. C.

### January 23-26 National Sand and Gravel Association and National Ready Mixed Concrete Association

Forty-fifth NSGA annual convention, 31st NRMCA annual convention, Americana Hotel, Miami Beach, Fla.

### January 23-26 Plant Maintenance and Engineering Show and Conference

Exhibit, International Amphitheatre,

Chicago, Ill. Clapp & Poliak, 341 Madison Ave., New York 17, N. Y.

### January 25-27 New York State Highway Superintendents Association

Winter meeting, Sheraton-Ten Eyk Hotel, Albany, N. Y. H. R. Madison, secretary, NYSHSA, 1420 Western Ave., Albany, N. Y.

### January 30-February 2 National Bituminous Concrete Association

Sixth annual meeting, Shamrock Hotel, Houston, Texas. H. K. Griffith, executive director, NBCA, 1145 19th St. N.W., Washington 6, D. C.

### February 5-9 Associated Equipment Distributors

Annual convention, Statler-Hilton Hotel, Los Angeles, Calif. W. G. Bowman, convention manager, AED, 30 E. Cedar St., Chicago, Ill.

### February 6-8 Association of Asphalt Paving Technologists

Meeting, Hotel Francis Marion, Charleston, S. C. Ward K. Parr, secretary-treasurer, AAPT, 1124 E. Engineering Bldg., University of Michigan, Ann Arbor, Mich.

### February 13-14 Georgia Highway Conference

Annual conference, Georgia Institute of Technology, Atlanta, Ga. Director, Short Courses and Conferences, GHC, Georgia Institute of Technology, Atlanta 13, Ga.

### February 15-17 Northwest Highway Engineering Conference

Conference, More Hall, University of Washington, Seattle, Wash. Roy Sawhill, professor of civil engineering, NHEC, More Hall, University of Washington, Seattle 4, Wash.

### February 20-23 American Concrete Institute

Fifty-seventh annual convention, Chase Park Plaza Hotel, St. Louis, Mo. William A. Maples, secretary-treasurer, ACI, P. O. Box 4754, Redford Station, Detroit 18, Mich.

### February 23-24 Mississippi Highway Conference

Seventh annual conference, Center for Continuation Study, University of Mississippi, Oxford, Miss. W. M. Jones, Jr., director, Department of Conferences and Institutes, MHC, University of Mississippi, Oxford, Miss.

### February 24-25 Highway Engineering Conference of the University of Colorado

Thirty-fourth annual conference, University Memorial Bldg., Boulder, Colo. R. C. Rautenstrauss, professor and chairman, department of civil engineering, HECUC, University of Colorado, Boulder, Colo.

### February 27-March 2 Associated General Contractors of America

Annual meeting, Statler-Hilton Hotel, Boston, Mass. James D. Marshall, executive director, AGC, 20th and E Sts., Washington 6, D. C.

### February 28-March 2 Illinois Highway Engineering Conference

Forty-seventh annual conference, Illinois Union Bldg., University of Illinois, Urbana, Ill. John W. Hutchinson, assistant director, IHEC, 304 Civil Engineering Hall, University of Illinois, Urbana, Ill.

### March 1-2 Kentucky Highway Conference

Conference, University of Kentucky, Lexington, Ky. D. K. Blythe, head, Civil Engineering Department, KHC, University of Kentucky, Lexington, Ky.

### March 5-8 American Road Builders' Association

Fifty-ninth convention, Chalfonte-Haddon Hall, Atlantic City, N. J. American Road Builders' Association, World Center Bldg., Washington 6, D. C.

### March 13-17 National Association of Corrosion Engineers

Seventeenth annual conference and 1961 Corrosion Show, Hotel Statler, Buffalo, N. Y. T. J. Hull, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

### March 15-17 Short Course for Superintendents and Operators of Water and Sewerage Systems

Twenty-fourth annual course, Pleasant Hall, Louisiana State University, Baton Rouge, La. General Extension Division, Pleasant Hall, Louisiana State University, Baton Rouge, La.

## Corps of Engineers has job openings

■ The New York office of the U. S. Army Corps of Engineers is seeking qualified personnel to fill position vacancies. Starting salaries range from \$6,435 to \$8,955.

The following positions are available: in Plattsburgh, N. Y., 1 construction management engineer, 3 construction representatives; in New York City, 2 hydraulic engineers (design), 2 architectural engineers (estimates), 1 architectural engineer (spec), 2 structural engineers, 1 civil engineers (general), and 2 engineering technicians (general).

Interested applicants should write or call the Personnel Branch, U. S. Army Engineer District, New York Corps of Engineers, 111 E. 16th St., New York 3, N. Y.



**IN...UP...BATCHING**  
**In 2 Hours or Less!**

**100-120 cu. yd. per hr. ROVER "two piece" mobile batching plant**

Mobility, simplicity, and big capacity production make ROVER the hottest over-the-road plant package available today!

#### 100% MOBILITY

Rover is completely mobile . . . comes in two units, each mounted on wheels with fifth wheel built in. Wiring, piping, and plug-in connections are all in place for easy hookup. You can erect Rover and be batching in two hours or less.

Both units meet road limits for traveling without special permits in most states.

Rover is truly the biggest capacity, fully mobile batch plant around. Rated cap.: 100-120 cu. yds. per hr.

#### EASY OPERATION

Designed for one-man operation. All controls for cement and aggregate weighing and discharge are in one location.

All batching is automatic, complete with electrical interlocks.

Field-proved, high capacity, low maintenance components used throughout. Simple "make and break" switches . . . accomplishes automatic batching accurately.

Wired for both 220v and 440v . . . ready to go wherever you go.



JOHNSON GOMPER . . . here's another low-cost batch plant from Johnson. Delivers 60 to 70 cu. yds. per hr. Comes in 3 units: Cement Plant, Overhead Storage Bin, and Aggregate Batcher with Conveyor Section. Available with or without wheels. Ask for details.



**C. S. JOHNSON CO.**  
Champaign, Ill., Stockton, Calif.

**KOEHRING**  
A Division of  
Company

For more facts, use Request Card at page 18 and circle No. 286

2103

CONTRACTORS AND ENGINEERS

# PRODUCT LITERATURE

To obtain free copies of any of the literature described in the following section, circle the designated number on the Request Card at page 18.

**Motor scraper**—a copiously illustrated booklet on the Allis-Chalmers Model TS-160 motor scraper, a 7-yard struck, 9½-yard heaped, 155-hp machine. Among the many advantages listed is a non-stop turn in 24 feet 8½ inches. Full page of specifications. Bulletin MS-1322.

Write to the Allis-Chalmers Mfg. Co., Construction Machinery Division, Dept. C&E, Box 512, Milwaukee, Wis., or use the Request Card at page 18. Circle No. 169.

**Soil stabilizer**—a technical bulletin describing the use of phosphoric acid as a soil stabilizer in highway construction. Describes subgrade and base-course stabilization by phosphoric acid; field, laboratory tests and results; test procedures; and properties of the product. Photographs show application methods, and charts show various laboratory test results. Booklet No. I-186.

Write to the Monsanto Chemical Co., Inorganic Chemicals Division, Dept. C&E, 800 N. Lindbergh Blvd., St. Louis, Mo., or use the Request Card at page 18. Circle No. 4.

**Paver operation**—literature describing the Blaw-Knox operator's control console that simplifies operation of the redesigned Express Paver. In addition to the control panel, from which a 10-ton-capacity folding hopper, traction clutch, and other standard equipment are hydraulically manipulated, the machine now includes wheel-type power steering. Bulletin No. 2656.

Write to the Blaw-Knox Co., Construction Equipment Division, Dept. C&E, Mattoon, Ill., or use the Request Card at page 18. Circle No. 139.

**Motors**—a bulletin describing design features, performance characteristics, and size range of Lincoln's redesigned line of squirrel-cage induction motors. Designed to increase motor life under severe operating conditions, multiguard stator encapsulation and open protected construction are said to make the motor impervious to water, acid, vibration, and both mechanical and electrical abuse. Photos, specifications. Bulletin No. 6100.1.

Write to The Lincoln Electric Co., Dept. C&E, P. O. Box 3115, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 36.

**Two-way radio**—literature describing the Motrac 2-way radio designed to operate with any 6 or 12-volt system. Sketches and photographs. Bulletin No. E 248-B.

Write to Motorola Communications & Electronics, Inc., Dept. C&E, 4501 W. Augusta Blvd., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 149.

**Drills, compressors**—a bulletin giving information on the Le Roi Trac-Newmatic self-propelled blast-hole drill, as well as specifications for the firm's stationary compressors from 25 to 100 horsepower. The dust collector and line oiler, and the portable and Tractair compressor line, are included together with a description of air tools.

Write to the Le Roi Division, Westinghouse Air Brake Co., Dept. CG-15, Dept. C&E, Sidney, Ohio, or use the Request Card at page 18. Circle No. 39.

**Soil-sampling equipment**—a booklet illustrating and describing the most recent changes in Sprague & Henwood's complete line of soil-sampling equipment. Drawings, charts, and photographs. Bulletin 300-1.

Write to Sprague & Henwood, Inc., Dept. C&E, 221 W. Olive St., Scranton 2, Pa., or use the Request Card at page 18. Circle No. 48.

**Hardsurfacing**—an illustrated engineering data sheet discussing hardsurfacing austenitic manganese steel with Colmonoy No. 1, Special No. 1, and Colmonoy No. 2. Covers typical uses of manganese steel and the need for hardsurfacing. Includes complete recommendations for application of the three Colmonoy alloys. Data Sheet No. 55.

Write to the Wall Colmonoy Corp., Dept. C&E, 19345 John R. St., Detroit 3, Mich., or use the Request Card at page 18. Circle No. 62.

**Hydraulic side boom**—literature detailing Midwestern's Little Boomer hydraulic side boom for the International Model I-460 wheel tractor. Contains specifications, as well as data on optional equipment.

Write to the Midwestern Mfg. Co., Dept. C&E, P. O. Box 1886, Tulsa 1, Okla., or use the Request Card at page 18. Circle No. 110.

**Air-line oilers**—a new and comprehensive bulletin on Gardner-Denver air-line oilers. Gives operational and specification data on oilers with half-pint to 5-gallon capacities. Describes the company's various-size oiler models and lists the data on care and operation of pipe lines, hoses, and lubrication. Graphically illustrated. Bulletin LO-2: Fifth Edition.

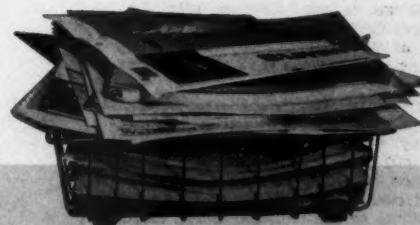
Write to the Gardner-Denver Co., Dept. C&E, S. Front St., Quincy, Ill., or use the the Request Card at page 18. Circle No. 30.

**Elevating grader**—a bulletin on the Domor Model K12 elevating grader for use with Cat No. 12, 14, and 112 motor graders. Features listed include heavy-duty gear box to withstand grader shockloads, hinged conveyor to increase mobility, and chevron-type cleats to prevent backslip of material. Specifications, photographs, dimensional drawing. Form No. 1014.

Write to the Ulrich Mfg. Co., Dept. C&E, Roanoke, Ill., or use the Request Card at page 18. Circle No. 129.

**Heavy concrete construction**—an informative and well illustrated booklet on the forming of concrete locks, dams, powerhouses, and tunnels. Tying and anchorage systems. Typical applications for heavy formwork. Many charts and tables. Bulletin No. 9.

Write to the Richmond Screw Anchor Co., Inc., Dept. C&E, 816-838 Liberty Ave., Brooklyn 8, N. Y., or use the Request Card at page 18. Circle No. 105.





**Equipment cabs**—literature describing Campbell all-weather cabs for tractors, tractor shovels, graders, and similar equipment.

Write to the Campbell Detachable Cab Co., Dept. C&E, Box 278, Wauconda, Ill., or use the Request Card at page 18. Circle No. 56.

**Pneumatic tool accessories**—a catalog describing the Brunner & Lay line of pneumatic tool accessories, carbide-inserted Rok-Bits, drill steels and accessories, moli points, and clay spades. Photograph and specifications for each item listed. Catalog No. 759R.

Write to Brunner & Lay, Inc., Dept. C&E, 9300 W. King St., Franklin Park, Ill., or use the Request Card at page 18. Circle No. 117.

**Earthmoving-equipment training**—a brochure on the Greer Technical Institute, a school specializing in the operation and maintenance of heavy equipment. Gives course outlines, information on prices.

Write to the Greer Technical Institute, Dept. C&E, Box 278, Braidwood, Ill., or use the Request Card at page 18. Circle No. 47.

**Universal joints**—a catalog describing and illustrating Borg-Warner roller-bearing universal joints. Instructions on lubrication, assembly, and disassembly. Order-specification data.

Write to the Mechanics Universal Joint Division, Borg-Warner Corp., Dept. C&E, 2020 Harrison Ave., Rockford, Ill., or use the Request Card at page 18. Circle No. 64.

**Prefabricated bridge**—a brochure discussing Bailey bridges—all-purpose prefabricated highway bridges designed for portability and speed of erection. Contains technical description, illustrated with dimensional drawings and tables.

Write to Bailey Bridge Rentals & Equipment, Dept. C&E, P. O. Box 753, San Luis Obispo, Calif., or use the Request Card at page 18. Circle No. 154.

**Motor grader**—a comprehensive specification sheet on the Gallon Model 503 motor grader available with 58-hp gasoline or diesel engine. Also gives information on optional equipment including hydraulic shiftable moldboard and enclosed, all-steel cab. Leaflet No. 399-C.

Write to The Gallon Iron Works & Mfg. Co., Dept. C&E, Gallon, Ohio, or use the Request Card at page 18. Circle No. 152.

**Chain hooks**—data sheet describing Big Orange chain hooks. Features include oversize shackle heads for extra strength, and plastic coating of all hooks to prevent rust and promote clean handling. Form No. 538-3.

Write to Midland Industries, Inc., Dept. C&E, 910 Second Ave. S. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 199.

**Radial stacker**—a bulletin on the Kolman Model 101-R radial stacker for stockpiling materials. Offered in belt widths of 18 through 36 inches and lengths up to 150 feet, this unit features minimum segregation, simplified installation, maximum portability, and fingertip control. Photographs. Bulletin 101-R.

Write to the Kolman Mfg. Co., Dept. C&E, 4922 W. 12th St., Sioux Falls, S. Dak., or use the Request Card at page 18. Circle No. 194.

**Chassis lubricants**—a booklet discussing the benefits of Gulfex Moly, a grease for truck chassis that is said to adhere to the metal even under severe oscillating motion or wet conditions.

Write to the Gulf Oil Corp., Dept. C&E, P. O. Box 2140, Houston, Texas, or use the Request Card at page 18. Circle No. 180.

**Rear dumper**—a catalog on the International Payhauler Model 65 rear dumper featuring corrugated body and 250-hp engine. Drawings show how the unit averages up to 30 per cent faster speeds on grades. Photographs of major components. Catalog No. CR-744-I.

Write to the International Harvester Co., Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 189.

**Concrete-drilling machines**—a brochure, with photographs, describing Molco concrete-drilling machines for holes and cores. Models are available for drilling holes from 3/16 inch to 14 inches in diameter.

Write to Molco, Dept. C&E, 8015 S. W. Oleson Road, Portland, Ore., or use the Request Card at page 18. Circle No. 192.

**Replacement bearings**—a catalog on Monmouth aluminum engine replacement bearings for a wide variety of Caterpillar construction machinery. Well illustrated with photographs. Handy reference section for determining applicable bearings.

Write to Clevite Service, division of the Clevite Corp., Dept. C&E, 6545 Carnegie Ave., Cleveland 3, Ohio, or use the Request Card at page 18. Circle No. 60.

**Tandem push block**—illustrated literature on the Pushin'-Cushin' rear-mounted tandem push block for Cat D9 and D8 tractors. Emphasizes drop-pin installation and full-protection design.

Write to Pushin'-Cushin', Inc., Dept. C&E, Box 207, Perry, Kans., or use the Request Card at page 18. Circle No. 148.

**Puller**—a bulletin listing and illustrating the features of the Chisholm Moore Model B puller, available in capacities from 3/4 ton to 6 tons. Exceptionally versatile, this tool is designed to lift or pull in any position. Contains detailed specifications. Bulletin 146-H.

Write to the Columbus McKinnon Chain Corp., Chisholm-Moore Hardware Division, Dept. C&E, 6067 Fremont Ave., Tonawanda, N. Y., or use the Request Card that is bound in page 18. Circle No. 77.

**Scraper transporter**—a leaflet discussing the benefits of the Shepherd Transporter Model M267 for between-job transporting of Caterpillar DW21 tractor-scraper units. Photographs include a front view showing gage calibrated for direct reading of pounds of load supported. Specifications.

# Save on construction costs with the new '61 FORD TRUCKS

## SAVE FROM \$52 TO \$221 ON PRICE\* ALONE WITH FORD'S ECONOLINE PICKUP

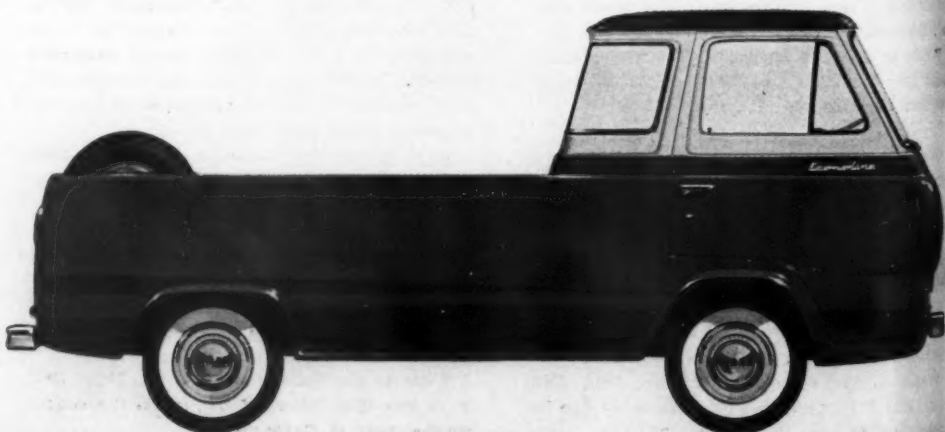
Profit-conscious contractors are finding it's good business to do business with the new Ford Econoline Pickup. It's America's lowest-priced\* pickup—bar none! Priced from \$52 to \$221 below other cab-forward economy pickups. But that's just the beginning! You get lively performance and proven gas economy with the popular Falcon Six. This modern engine goes 4,000 miles between oil changes, and has an aluminized muffler which lasts up to three times as long as ordinary mufflers.

And you can save more because Ford's functional design has pared away 1,000 pounds of dead weight, yet you still get the payload capacity of standard 1/2-tonners. The big 7-foot box provides a whopping 73 cubic feet of loadspace . . . that's up to 23% more than conventional

6 1/2-foot pickups. A full 49-inch tailgate opening means you can load items like standard sheets of 4' by 8' plywood. And the full-length flat floor permits bulky or heavy loads to be positioned easily by sliding them anywhere in the pickup box.

And you can save on maintenance expense, too. The engine cover can be lifted quickly exposing the entire engine for rapid service. Spark plugs, distributor, etc., are conveniently located to speed engine tune-ups. And major repairs can be made without ever removing the engine. One-piece cab-and-body construction provides increased rigidity and eliminates a major source of rust. In addition, all main underbody structural members are heavily zinc-coated to resist rust and corrosion.

\*Based on a comparison of latest available manufacturers' suggested retail delivered prices



tions furnished. Form No. 337.

Write to the Shepherd Machinery Co., Dept. C&E, 3400 S. San Gabriel River Parkway, East Los Angeles, Calif., or use the Request Card at page 18. Circle No. 124.

**Welding systems**—an illustrated brochure discussing the benefits of A. O. Smith multi-operator welding systems, which give up to 40 arcs from a single power source. According to the literature, these systems carry a welding load 3 to 4 times its rating in single-operator equipment. Brief specifications included. Bulletin No. MW-259.

Write to the A. O. Smith Corp., Dept. C&E, 3533 N. 27th St., Milwaukee 1, Wis., or use the Request Card bound in at page 18. Circle No. 125.

**Power tools**—a 50-page catalog covering the Black & Decker line of power tools and accessories. Includes portable electric drills, impact wrenches, belt sanders, shears and nibblers, and many others. Well illustrated with photographs. Specifications furnished. Catalog 1 (K).

Write to The Black & Decker Mfg. Co., Dept. C&E, E. Pennsylvania Ave., Towson 4, Md., or use the Request Card at page 18. Circle No. 63.

**Clamshell buckets**—a fact sheet on Johnson clamshell buckets for wide rehandling, general-purpose, and heavy-duty digging. Includes condensed specifications and drawings.

Write to the C. S. Johnson Co., Dept. C&E, Box 71, Champaign, Ill., or use the Request Card at page 18. Circle No. 31.

**Grader blades**—a brochure on the advantages of Shunk saw-tooth grader blades for a variety of uses. Illustrated with photographs and diagrams. Form No. 540.

Write to the Shunk Mfg. Co., Dept. C&E, Bucyrus, Ohio, or use the Request Card at page 18. Circle No. 163.

**Utility truck bodies**—a bulletin detailing the features of Reading utility truck bodies. Furnishing photographs and specifications, the literature covers the Cruiser series for ½ and ¾-ton chassis; Dreadnaught series for 1 and 1½-ton chassis; and the Clipper series for ½ and ¾-ton chassis. Brief description of accessories.

Write to the Reading Body Works, Inc., Dept. C&E, 420 Gregg Ave., Reading, Pa., or use the Request Card at page 18. Circle No. 184.

**Excavator**—literature describing the Cat 977 Series H Traxcavator, equipped with power-shaft transmission. According to the manufacturer, this machine offers as much as 25 per cent greater productivity than previous models under average job conditions. Illustrations.

Write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the card at page 18. Circle No. 229.

**Scaffolding**—a brochure on Beaver-Advance tubular-steel scaffolding. On-the-job photos of the scaffolding in use as shoring for structural concrete slabs; other photos show unusual applications. Also contains illustrated information on material hoisting towers, as well as on accessories. Catalog No. 62.

Write to the Beaver-Advance Corp., Dept. C&E, Box 792, Ellwood City, Pa., or use the Request Card at page 18. Circle No. 94.

**Forms for bridge decks**—illustrated data on USF leave-in-place galvanized steel forms for concrete bridge decks. Points out such benefits as fast erection, no stripping, and prefabrication. Drawings, photos, and a table showing allowable clear spans in inches.

Write to the United Steel Fabricators, Inc., Dept. C&E, Gasche St., Wooster, Ohio, or use the Request Card at page 18. Circle No. 193.

**Soil-survey instrument**—literature on the Michimho Model 374-M Vibroground, a portable instrument designed to quickly give data for soil studies in connection with foundation design, road building, borrow sites, bedrock determinations, pipeline locations, and similar construction work. States the literature, this 20-pound unit may be readily operated by one man without technical training. Bulletin 1-60.1.

Write to Associated Research, Inc., Dept. C&E, 3777 W. Belmont Ave., Chicago 18, Ill., or use the Request Card at page 18. Circle No. 126.

**Rock crusher**—a bulletin describing and illustrating the new Pulvo-Matic, a rock crusher with only one moving part. Approximate weight, required space, and approximate horsepower given for the three crusher sizes.

Write to the Frog, Switch & Mfg. Co., Dept. C&E, P. O. Box 431, Carlisle, Pa., or use the Request Card at page 18. Circle No. 27.

**Concrete cylinder pipe**—a hard-cover booklet on American pre-tensioned concrete cylinder pipe. Well illustrated with drawings and photographs, this booklet covers such subjects as handling and unloading, excavation and bedding, laying and assembling, backfilling and field testing.

Write to the American Pipe & Construction Co., Dept. C&E, 390 S. Atlantic Blvd., South Gate, Calif., or use the Request Card at page 18. Circle No. 23.

**Trucks and tractors**—an illustrated booklet detailing the construction and operating characteristics of GMC Model BW5500 and Model LW5500 tandem-axle trucks and tractors. Chassis dimensions shown for units equipped with standard specifications. Emphasizes the units' V-type 6-cylinder engine. Includes complete specifications.

Write to GMC Truck & Coach Division, Dept. C&E, 660 South Blvd. E., Pontiac 11, Mich., or use the Request Card at page 18. Circle No. 160.

**Hopper scales**—a brochure detailing the construction and operating characteristics of Cardinal suspension hopper scales, offered in capacities from 500 pounds up to and including 100,000 pounds and to fit any size hopper. According to the literature, these units can be adapted for square, round, or rectangular



## SAVE WITH FORD'S NEW 262-CU. IN. "BIG SIX" ALL-TRUCK ENGINE FOR TOP PERFORMANCE AND ECONOMY

America's lowest-priced\* medium-duty tilt-cab models now offer a big 262-cubic-inch Six with the power of big displacement, the gas economy of 6-cylinder design, plus the durability of heavy-duty construction. This engine features a sturdy stress-relieved head and block, strong forged steel crankshaft, long-lasting stellite-faced intake and exhaust valves and durable pyramid-type connecting rods. Positive Crankcase Ventilation reduces oil dilution and sludge formation to extend engine life. Ford's proven 292 V-8 and 292 HD V-8—the V-8's with "six-like" economy—are also available for your special power needs.

The popular Ford Tilt Cab Series outsells all other makes and for good reason! Their compact 82-inch BBC permits longer bodies within a given over-all length . . . for longer loads of lumber and building materials with excellent maneuverability. And set-back front axle design means more weight is carried on the front axle for greater payloads.

You also save with other new features like the stronger radiator with new lock-seam construction, and color-coded printed instrument panel electrical circuits that provide for greater reliability and simplified maintenance. In addition, Ford's parallel ladder-type frame, with standard 34-inch width, allows you to install new or transfer your present special construction bodies quicker and for less.

# 12,000 MILE OR 12 MONTH WARRANTY

**SAVE WITH GREATER DURABILITY** . . . on all 1961 Ford Trucks, each part, except tires and tubes, is now warranted by your dealer against defects in material and workmanship for 12 months or 12,000 miles, whichever occurs first. The warranty does not apply, of course, to normal maintenance service and to the replacement in normal maintenance of parts such as filters, spark plugs and ignition points. Never before have you had such protection . . . such evidence of long-term economy!

## NEWS OF MORE SAVINGS FOR HEAVY CONSTRUCTION WORK . . . ▶

hoppers. Bulletin No. 102.

Write to the Cardinal Scale Mfg. Co., Dept. C&E, P. O. Box 151, Webb City, Mo., or use the Request Card at page 18. Circle No. 78.

**Compact calculator**—a folder describing and illustrating the Fractomator, a small desk-top adding-subtracting machine that gives decimal amounts and ordinary figures up to 10 million, as well as dimensions in feet, inches, and sixteenths. Operating instructions, price list included.

Write to the Alexander Drafting Equipment Co., Dept. C&E, 640-642 N. Chester Ave., Pasadena, Calif., or use the Request Card at page 18. Circle No. 80.

**Crawler-mounted excavator**—an informative booklet describing the Insley Type M crawler-mounted excavator. Specifications; working ranges; lifting capacities. Emphasizes the machine's versatility. Photos, dimensional drawings, and graphs illustrate text. Catalog No. 300-3A.

Write to the Insley Mfg. Corp., Dept. C&E, P. O. Box 167, Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 106.

**Cold-weather concreting**—a pamphlet offering helpful hints on placing, finishing, and curing concrete in cold weather. Illustrations include drawings and a graph.

Write to the Alpha Portland Cement Co., Dept. C&E, 15 S. Third St., Easton, Pa., or use the Request Card at page 18. Circle No. 168.

**Tandem rollers**—a booklet describing and illustrating Huber-Warco tandem rollers offered in capacities of 5 to 8, 8 to 10, 8 to 12, and 10 to 14 tons. Drawings and photographs include close-ups of major components.

Write to the Huber-Warco Co., Dept. C&E, Box 501, Marion, Ohio, or use the Request Card at page 18. Circle No. 42.

**Crawler loader**—a specification sheet on the John Deere Model 1010 40-hp crawler loader available with diesel or gasoline 4-cylinder engine and a full line of matched working equipment including loader, bulldozers, backhoes, and specialized attachments such as a 4,000-pound-capacity side boom. Dimensional drawing, photographs.

Write to Deere & Co., Dept. C&E, 3300 River Drive, Moline, Ill., or use the Request Card at page 18. Circle No. 120.

**Asphalt-pavement coating**—application data on the use of Jennite J-16-R (rubberized) seal coat to protect extra-critical service areas of asphalt pavements. Includes directions for pavement preparation, and mixing and placement of Jennite J-16-R sand slurry. Index JRA-S-660.

Write to Maintenance, Inc., Dept. C&E, W. Liberty St., Extension, Wooster, Ohio, or use the Request Card at page 18. Circle No. 49.

**Fork truck**—a folder on the Pacer Model 620P 8,000-pound-capacity fork truck for a wide variety of material-handling jobs. Dimensional drawings illustrate the unit's compact design and maneuverability. Includes specifications.

Write to the American Road Equipment Co., Dept. C&E, 4201 N. 26th, Omaha, Nebr., or use the Request Card at page 18. Circle No. 93.

**Rams, pumps**—a booklet on Duff-Norton Ram-Pac hydraulic rams, pumps, and accessories. Covers 12 rams, 5 pumps—capacities 10 to 100 tons. Photographs illustrate text. Specifications furnished.

Write to the Duff-Norton Co., Dept. C&E, P. O. Box 1889, Pittsburgh 30, Pa., or use the Request Card at page 18. Circle No. 66.

**Diesel engines**—a brochure stressing the benefits of Detroit Series 53 diesel engines for small trucks. Includes several case-history reports, and is illustrated with many photographs, sketches, and graphs.

Write to the General Motors Corp., Detroit Diesel Engine Division, Dept. C&E, 13400 W. Outer Drive, Detroit 28, Mich., or use the Request Card at page 18. Circle No. 151.

**Jaw crusher**—literature describing a new Universal matched jaw crusher. Features listed include two moving jaws in a single crusher, and high-speed dual crushing action. General specifications, photographs, drawings. Bulletin 133-601.

Write to the Universal Engineering Corp., Dept. C&E, 625 C Ave. N.W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 171.

**Rock drill**—a bulletin discussing the benefits of the Atlas Copco Puma rock drill, said to be suitable for most kinds of drifting, as well as for sinking and stopping. Listed features include constant blowing to prevent dirt and water from entering chuck, and centralized controls for convenient handling. Also gives illustrated information on an integral-type pusher called the Auto-Leg. Leaflet E 1133.

Write to Atlas Copco Eastern, Inc., Dept. C&E, 610 Industrial Ave., Paramus, N. J., or use the Request Card at page 18. Circle No. 119.

**Air-entraining agent**—a pamphlet on the benefits of Permite N-Tair, an air-entraining agent said to give concrete better working qualities, improved plasticity and cohesiveness, and to reduce the tendency to segregate or bleed. Application data, dilution chart, information on container sizes available.

Write to Permiteco, Inc., Dept. C&E, P. O. Box 206, Station A, Dayton 2, Ohio, or use the Request Card at page 18. Circle No. 133.

**Diamond saw blades**—a brochure on J. K. Smit & Sons diamond saw blades. Covers the exact grade of blade to use, and the recommended depth of cut and speed of operation for a wide variety of materials. Introduces the firm's Pacemaker series which includes segmented blades in five grades with diameters of 8 inches and larger, and continuous-rim saw blades in two grades and in diameters of 3 inches and larger.

Write to J. K. Smit & Sons, Inc., Dept. C&E, Murray Hill, N. J., or use the card at page 18. Circle No. 69.

# Save on construction costs with the new '61 FORD TRUCKS

## NEW SUPER DUTIES CUT OPERATING COSTS GIVE PROVEN DURABILITY THAT'S BACKED BY A 100,000 MILE ENGINE WARRANTY

New 100,000-mile warranty on Super Duty V-8 gas engines is the most liberal in the industry. On 401-, 477- and 534-cu. in. V-8's, Ford Dealers will replace any major engine part (including block, heads, crankshaft, bearings, valves, pistons, rings) found to be defective in materials and workmanship providing trucks are used in normal service. The warranty covers full cost of replacement parts for 100,000 miles or 24 months, whichever occurs first . . . full labor costs for first year or 50,000 miles, sliding percentage scale thereafter. Never before have you had such protection . . . such evidence of long-term durability!

And you save with greater gas economy! Certified tests prove the new Super Duty V-8's give up to 20% better mileage. In addition, Ford's new lightweight, extra-hi-tensile single-channel frames (standard F-850—F-1000) give you long-lived durability combined with a lightness of weight for added

payloads. All in all, you get proven components and design features . . . in trucks built for maintenance and lower running costs.

**Save with Ford T-Series Super Duty Tandems**—exceptional durability, big payloads and low operating expenses. Ford T-850 and T-950 Tandems with Super Duty V-8 engines have rugged double channel, hi-tensile frames for maximum strength minimum weight. And they provide a wider range of chassis options so you can choose the right power train and load-carrying components for any job. Eaton and Timken rear axles are now available as bogie assemblies with up to 38,000-lb. capacity. And lightweight aluminum walking beams, wheels and gas tanks are available to keep chassis weight low . . . payloads high.

Ask your dealer about Ford's full tandem line—five T-Series with GVW's ranging from 28,000 to 51,000 lb. and GCW's up to 75,000 lb.



CONTRACTORS AND ENGINEERS

**Truck crane**—illustrated data on the Handlift light-duty truck crane for handling such items as paving forms, barrels of compound, and drums of oil. Control panel can be mounted inside or outside of the cab. Dimensional drawing, photographs, specifications. Form HL59-1.

Write to Teale & Co., Dept. C&E, P. O. Box 308, Omaha, Nebr., or use the Request Card at page 18. Circle No. 153.

**Trencher**—a folder on the Vermeer Pow-R-Ditcher Model 524T trencher. Stresses the versatility of this self-propelled, crawler-mounted ditching machine designed to dig trenches 8 to 24 inches wide and up to 6 feet deep. Action photographs, specifications. Brief illustrated data

on the 524T tilting-bed trailer.

Write to the Vermeer Mfg. Co., Dept. C&E, Box 188, Pella, Iowa, or use the Request Card at page 18. Circle No. 130.

**Concrete accessories**—a folder on Symons concrete accessories including stake puller, steel stakes, column plants, and safety shores. Specifications given.

Write to the Symons Clamp & Mfg. Co., Dept. C&E, 4249 Diversey Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 211.

**Mountable spreaders**—a brochure on Fox dual-purpose mountable spreaders for sand, cinders, salt, calcium chloride. Emphasizes 15-minute mounting, one-man operation, heavy-duty construction, and adjustable spread from 8 to 40 feet. Also

stresses the units' ability to handle seal-coating and (with special attachment) trench-filling assignments. Specifications, data on optional equipment. Action photos, close-ups of important components. Form No. 20M.

Write to the Fox River Tractor Co., Road Machinery Division, Dept. C&E, 1020 N. Rankin St., Appleton, Wis., or use the Request Card at page 18. Circle No. 73.

**Trencher**—literature describing the Cleveland Model JS-30 trencher featuring instant lateral digging-wheel positioning. Photographs and a dimensional drawing illustrate text. Specifications. Bulletin L-111.

Write to The Cleveland Trencher Co., Dept. C&E, 20100 St. Clair Ave., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 98.

**Materials heater**—a pamphlet discussing the Chattanooga Model 106-0 materials heater for hot oil, with modulating light oil burner and electronic safety controls. Large cutaway drawing and specifications.

Write to the Industrial Boiler Co., Dept. C&E, P. O. Box 9126, Chattanooga, Tenn., or use the Request Card at page 18. Circle No. 161.

**Coating for prestress tendons**—a fact sheet discussing Sika Lubabon, a bond-retardant coating for prestress tendons. Information on application. Text illustrated with sketches.

Write to the Sika Chemical Corp., Dept. C&E, 35 Gregory Ave., Passaic, N. J., or use the Request Card at page 18. Circle No. 222.

**Flywheel power takeoff**—a bulletin describing Clark Equipment's Model P-200 flywheel power takeoff, operable at both full torque and a 1.27:1 ratio. Indicates dimensions on transverse and longitudinal scale drawings. Also contains a cutaway photograph of the unit, and a drawing of the power takeoff installed between transmission and engine. Tips on application included. Form No. FT200.

Write to the Clark Equipment Co., Transmission Division, Dept. C&E, Jackson, Mich., or use the Request Card at page 18. Circle No. 150.

**Rippers**—a brochure on Greenville rippers for International Models TD-15, TD-20, and TD-25 crawler tractors. Illustrated with photographs and drawings; points out such features as simple pin and shank adjustment, fingertip hydraulic control, and live swivel action. Specifications; data on accessories.

Write to the Greenville Steel Car Co., Dept. C&E, Greenville, Pa., or use the Request Card at page 18. Circle No. 118.

**Forms for concreting**—a catalog covering the complete Metaforms line of steel forms for concrete construction. Building forms, road-paving forms, as well as curb and gutter, sidewalk, and circular tank forms are among the types discussed. Illustrated with sketches, photos. Catalog No. 25.

Write to the Metal Forms Corp., Dept. C&E, 3334 N. Booth St., Milwaukee 12, Wis., or use the Request Card at page 18. Circle No. 143.

**Load binders; hooks**—illustrated literature on Canton load binders and various types of hooks. Specifications given for each item listed.

Write to The Canton Mfg. Co., Dept. C&E, 2400 13th St. N. E., Canton 5, Ohio, or use the Request Card at page 18. Circle No. 116.

**Tower crane**—a folder, with helpful drawing and on-the-job photographs, discussing the advantages of Pecco Towercranes. Gives general specifications for Models 401, 561, and 921. Five safety features emphasized. Full page on erection of crane.

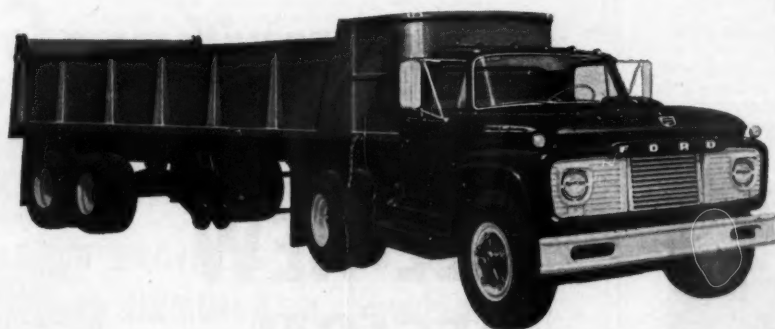
Write to the American Pecco Corp., Dept. C&E, 188 E. Post Road, White Plains, N. Y., or use the Request Card at page 18. Circle No. 203.

**Bar cutters, benders**—a folder on Peddinghaus bar benders and cutters for use with concrete-reinforcement steel. Page devoted to capacities and specifications.

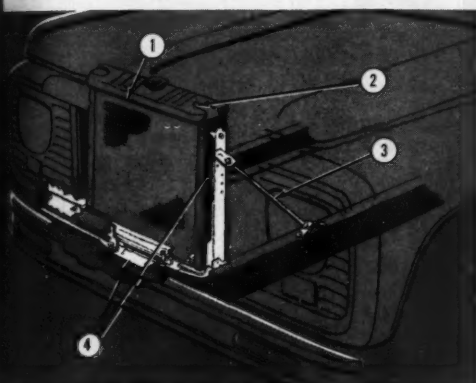
Write to the Albert Klingelhofer Machine Tool Corp., Dept. C&E, 165 Mill Lane, Mountainside, N. J., or use the Card at page 18. Circle No. 141.

**Chassis dynamometer**—literature describing the Clayton Series CT chassis dynamometer, rated from 150 to 800 horsepower, for medium and heavy-duty diesel and gasoline trucks. According to the brochure, this unit provides infinitely variable load and speed control for duplicating all driving conditions.

Write to the Clayton Mfg. Co., (Continued on next page)



SAVE WITH NEW HEAVY-DUTY CONSTRUCTION THAT DOUBLES CAB, SHEET METAL AND RADIATOR LIFE



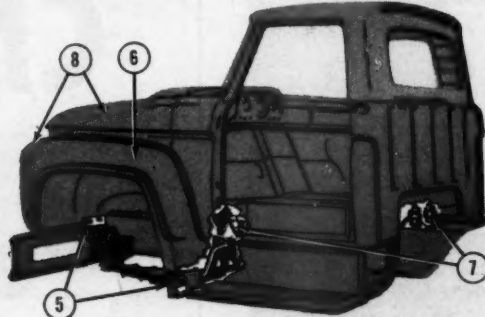
① Save with Ford's exclusive "lock-seam" radiator construction that doubles the solder area at key seams for greatly increased strength and longer radiator life.

② Save with heavier-gauge metal on radiator tank and header. Tanks and header have thicker walls to resist vibration, jolts and corrosion for greater reliability.

③ Save with independent radiator mountings, separate from front-end sheet metal. This means that road shocks and shakes are not transmitted to the radiator through sheet metal . . . tanks, tubes and connections last longer, require less maintenance.

④ Save with "horse collar" mounting for extended radiator life. This new mounting on resilient rubber at the center of frame cross member soaks up any frame flexing . . . cuts wear and tear on entire cooling system.

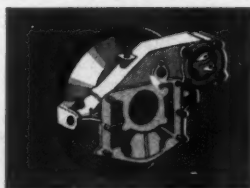
⑤ Save with independent fender mountings. Fenders are bolted to a rubber-cushioned transverse bracket at the front and a frame-mounted bracket at the rear. This mounting, independent of both cab and radiator, eliminates stress transfers for increased fender life.



⑥ Save with removable fenders. The quick and easy removal of only 8 bolts per fender provides faster service accessibility to the engine area, saving valuable maintenance time.

⑦ Save with new 3-point cab mounting system for greater cab durability. Two outboard front mounts plus a centered "twin" rear mount provide a triangular system that holds the cab stationary while allowing the frame to move independently . . . reducing strain on the cab.

⑧ Save with 42% heavier-gauge sheet metal in fenders, hood, cab floor pan and toeboard for greater strength, greater durability.



Save with Ford's new Full-Torque flywheel power take-off . . . now available on T-750's and up, to power construction equipment like transit mixers. It's much simpler and more efficient than long, complicated hookups needed with the front-end drives. And the flywheel PTO is lighter in weight—only 105 pounds—for greater payloads.

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YOUR FORD DEALER'S "CERTIFIED ECONOMY BOOK" PROVES IT FOR SURE...

FORD DIVISION, Ford Motor Company.

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Dept. C&E, P. O. Box 550, El Monte, Calif., or use the Request Card at page 18. Circle No. 147.

**Legal loads for trucks**—a 66-page booklet describing truck and trailer size and weight restrictions for 1961 throughout the continental United States and Canada.

Write to the FWD Corp., Dept. C&E, Clintonville, Wis., or use the card at page 18. Circle No. 127.

**Rock bits**—literature describing and illustrating Varel exploration rock bits. Shows five basic types. Helpful chart includes price list.

Write to the Varel Mfg. Co., Dept. C&E, 9230 Denton Drive, Dallas 20, Texas, or use the Request Card at page 18. Circle No. 50.

**Backhoe**—a bulletin on the American Holst positive-pressure backhoe attachment. Diagrams show operating principle; also how this unit keeps the boom down, brings out heaped dipper at every pass. Form No. 700-2A.

Write to the American Holst & Derrick Co., Dept. C&E, 63 S. Robert St., St. Paul 7, Minn., or use the Request Card at page 18. Circle No. 95.

**Crane-excavator**—a bulletin on the Heco Model RM-437 crane-excavator (¾-yard excavator, 9-ton crane). Well illustrated with sketches showing dragline, crane, clamshell, backhoe, and shovel working ranges. Specifications given.

Write to the Heco Division, Hardwicke-Etter Co., Dept. C&E, Sherman, Texas, or use the Request Card at page 18. Circle No. 207.

**Jaw crushers**—a catalog describing Pioneer overhead eccentric jaw crushers. Lists 10 major benefits of these units, and contains a profusion of illustrations including photographs, dimensional drawings, close-ups of important components, charts, and tables. Specifications furnished. Form No. 693 (50W15).

Write to Pioneer Engineering, division of Poor & Co., Inc., Dept. C&E, 3200 Como Ave. S.E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 157.

**Blasting supplies**—a catalog describing Trojan explosives and blasting supplies. Photographs and charts illustrate text. Catalog No. 101.

Write to the Trojan Powder Co., Dept. C&E, 17 N. Seventh St., Allentown, Pa., or use the Request Card at page 18. Circle No. 7.

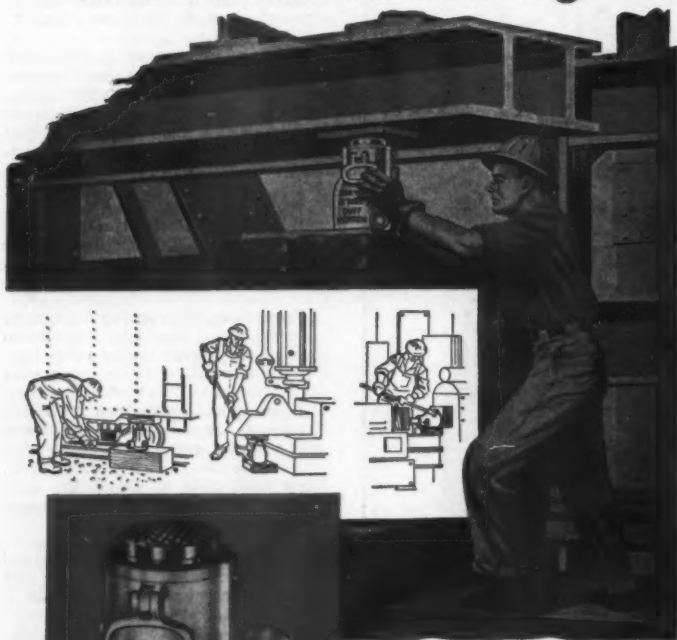
**Generators**—a booklet describing several models of Pioneer Gen-E-Motor belt-driven generators and electric generating plants. Illustrated with photographs and tables.

Write to the Pioneer Gen-E-Motor Corp., Dept. C&E, 5841 W. Dickens Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 170.

**Mobile batching plants**—a bulletin on the new Heltzel Series 600, 700, 800, and 900 self-erecting mobile batching plants. Points out that models are available for ready-mix, dry-batch, or central-mix requirements. Well illustrated with photos and dimensional drawings. Specifications. Bulletin 60-22.

Write to the Heltzel Steel Form & Iron Co., Dept. C&E, Warren, Ohio, or use the Request Card at page 18. Circle No. 246.

## 200,000 Pounds Of Lifting Power In a 98 Pound Package



The 100 ton capacity Duff-Norton Aluminum Screw Jack weighs only 98 pounds. It is easier to handle and spot than any other type of jack of the same capacity which may weigh two to five times more.

Maintenance is virtually eliminated by the rugged construction—aluminum alloy housing and base—heat-treated steel lifting screw—sealed-in lifetime lubrication. This enables these jacks to withstand hard usage in any weather without damage.

The design of these jacks makes it impossible for them to creep—will support load indefinitely. They can be used in any position—have no fluid to leak—no air to lock. Duff-Norton Screw Jacks are ideal for heavy riggers or for construction and maintenance crews in shipyards, steel mills and other industries.

Duff-Norton Screw Jacks are available in 25, 35, 50 and 100 ton capacities in aluminum—in 15, 25, 35 and 50 ton capacities in malleable iron. For full details on these durable, all-purpose lifting jacks ask your distributor or write for Bulletin AD-12s.

# DUFF-NORTON COMPANY

Four Gateway Center • Pittsburgh 22, Pa.

#### DUFF-NORTON JACKS

Ratchet • Screw  
Hydraulic • Worm Gear

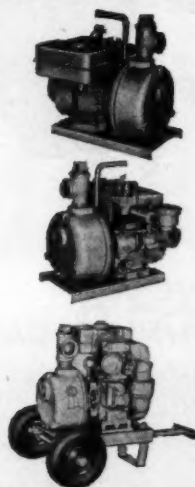


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Hand Chain • Electric

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### \* more Gallons per hour

Will pump more water in less time—with less attending care—less maintenance.

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Faster, automatic, more reliable priming on even highest suction lifts.

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Simplified construction, fewer moving parts. Built to take roughest, toughest, day-in, day-out beating without breakdown.

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PRIME... AND HOW FAST THEY WILL MOVE WATER! Contact your CMC distributor today and ask for a demonstration.

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CONSTRUCTION MACHINERY COMPANY  
WATERLOO, IOWA

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CONTRACTORS AND ENGINEERS

**Air compressors**—a folder illustrating and describing Schramm portable air compressors. Covers Models 20, 35, 75, 125, 250, 315, and 600-TC. Also gives brief data on toolboxes, hose, hose reels, and manifolds, as well as on Schramm Pneumattractors. Bulletin SPB-60.

Write to Schramm, Inc., Dept. C&E, 900 E. Virginia Ave., West Chester, Pa., or use the Request Card at page 18. Circle No. 8.

**Starting-fluid injectors**—a brochure covering Phillips Zero Start ether-base starting-fluid injectors. Illustrates two models.

Write to the Phillips Mfg. Co., Dept. C&E, 8200 Grand Ave. S., Minneapolis 20, Minn., or use the Request Card at page 18. Circle No. 59.

**Welding accessories**—a catalog of the broad line of Hobart welding accessories. Includes headshields, handshields, cleaning tools, electrode holders, welding fume exhauster, and many others. Photos illustrate text. Catalog No. EW-211.

Write to the Hobart Bros. Co., Dept. C&E, Hobart Square, Box 8129, Troy, Ohio, or use the Request Card at page 18. Circle No. 114.

**Portable power spade**—literature detailing the advantages of the Racine portable power spade designed for a wide range of work uses. Completely self-contained, one-man operated. Specifications furnished. Catalog C-11.

Write to Racine Hydraulics & Machinery, Inc., Machinery Division, Dept. C&E, 1524 Frederick St., Racine, Wis., or use the Request Card at page 18. Circle No. 166.

**Grader-mounted loader**—a specification sheet on the Martin Graderloader Model GL-12 for Caterpillar Nos. 112, 12, and 14 motor graders. Points out that Graderloaders are ideal for loading windrows, stockpile work, road maintenance, snow removal, setting and backfilling culverts, and all general loading at the construction site. Photographs. Form No. 132.

Write to the Martin Co., Dept. C&E, 620 Andrews Ave., Kewanee, Ill., or use the Request Card at page 18. Circle No. 210.

**Pumps**—literature describing and illustrating several models of Rice portable, self-priming pumps. Shows units offering capacities from 4,000 to 240,000 gph. Specifications. Data on typical construction. Bulletin CP 1-17.

Write to the Rice Pump & Machine Co., Dept. C&E, 400 Park Ave., Belgium, Wis., or use the Request Card at page 18. Circle No. 104.

**Screening, crushing, conveying**—a fact sheet on Lippmann Grizzly King jaw crushers, Washmore portable washing plants, and Screen-All vibrating screens. Also discusses the firm's pulverizers, roll crushers, and portable belt conveyors.

Write to the Lippmann Engineering Works, Inc., Dept. C&E, 4603 W. Mitchell St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 208.

**Clutches, brakes**—a chart to aid in the selection of Mercury heavy-duty clutches and brakes for a wide range of gasoline engines. Detailed specifications furnished.

Write to the Mercury Clutch Division, Automatic Steel Products Co., Inc., Dept. C&E, 1201 Camden Ave. S. W., Canton 6, Ohio, or use the Request Card at page 18. Circle No. 87.

**Tractor-mounted rake**—literature describing the York Model RH tractor-mounted heavy-duty rake with scarifier and grader blade. Points out that all three tools are combined in a single compact unit for attachment to a 3-point-hitch tractor. Photos and specifications.

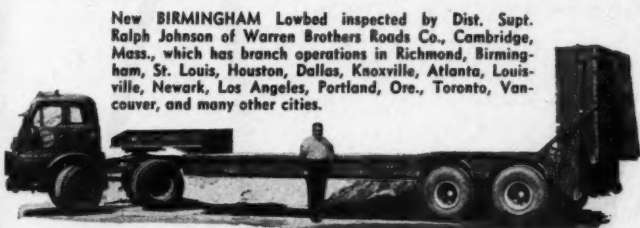
Write to the York Modern Corp., Dept. C&E, Unadilla, N. Y., or use the Request Card at page 18. Circle No. 137.

**Hydraulic moldboard shift**—a fact sheet describing the Rivinius hydraulic moldboard shift for No. 14, 12, and 112 Cat motor graders equipped with sliding moldboards. According to the literature, this unit moves and locks the moldboard to any point in a matter of seconds. Text illustrated. Form No. 506.

Write to Rivinius, Inc., Dept. C&E, 602 W. Center St., Eureka, Ill., or use the Request Card at page 18. Circle No. 134.

**Diamond bits**—literature on Christensen diamond bits, core barrels, reaming shells, casing shoes and bits, and reamers. Data on how to select proper bit. Table of standard diamond set dimensions. Parts, price list. Text well illustrated with drawings, photographs.

Write to Christensen Diamond



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"One of our BIRMINGHAM Lowbeds has been in continuous service 14 years," states Mr. Johnson, "and it is one of the best investments we ever made. It still is good for many more years' service."

The new BIRMINGHAM Lowbed shown above is a 40-ton trailer with hydraulic ramps which provide easy loading and hauling of pavers from job to job. Warren Brothers is a national organization which builds streets, highways, airfields, etc., specializing in asphalt paving.

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**BIRMINGHAM MANUFACTURING COMPANY, Inc.**

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PLATFORMS

TOTEM-ALLS

LOWBEDS

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say what they do  
do what they say

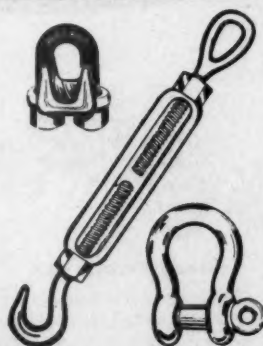
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**SAFER**—load capacity is permanently forged on every hook... eliminates guesswork, overloading.

**EXTRA CAPACITY**—forged, heat treated, and tested to give you industry's highest guaranteed capacity per size.

**WIDEST LINE**— $\frac{3}{4}$  thru 150-ton capacities... all popular shapes and types... carbon steel, alloy steel, or non-sparking bronze.

CL-951



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Division of  
**AMERICAN  
HOIST**

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To make impure  
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corrupt.

Our Sta 'N Play gal and her  
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Sta-Crete ships an  
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to meet your job  
requirements—from a playground  
for Sherman tanks  
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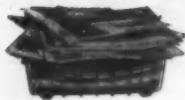


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Products, Mining Division, Dept. C&E, P. O. Box 387, Salt Lake City, Utah, or use the Request Card at page 18. Circle No. 81.

**Low-bed trailer**—a specification sheet illustrating and describing the Talbert Challenger Model TD-18-RG low-bed trailer featuring removable gooseneck. This trailer has a capacity of 18 tons. Bulletin 107-A.

Write to Talbert Trailers, Inc., Dept. C&E, 7950 47th St., Lyons, Ill., or use the Request Card at page 18. Circle No. 178.

**Anchorage, connectors**—a technical bulletin on Stressteel anchorages and connectors. Covers several types, includes data on application. Drawings illustrate text. Bulletin No. 6.

Write to the Stressteel Corp., Dept. C&E, 221 Conyngham Ave., Wilkes-Barre, Pa., or use the Request Card at page 18. Circle No. 32.

**Concrete vibrator**—specification sheet with description of the Viberette electric internal vibrator especially designed for prestressed concrete, narrow building forms, and laboratory and field test work. Form No. EV118.

Write to the Viber Co., Dept. C&E, 726 S. Flower St., Burbank, Calif., or use the Request Card at page 18. Circle No. 185.

**Oil filters**—a catalog covering the complete line of Wix oil filters for all diesel and gasoline-engine equipment. Includes comprehensive replacement section. Illustrated with photographs. Catalog No. 660.

Write to the Wix Corp., Dept. C&E, Gastonia, N. C., or use the Request Card at page 18. Circle No. 91.

**Conveyors**—a booklet detailing and illustrating the construction and operation characteristics of Cedarapids Strigid lattice-frame conveyors. Standardized components for faster erection. On-the-job photos. Also contains brief data on Cedarapids crushing and bituminous paving equipment. Bulletin CON-2.

Write to the Iowa Mfg. Co., Dept. C&E, 916 16th St. N. E., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 100.

**Portable buildings**—information on Economy construction buildings designed for a variety of uses and featured as simple to erect and re-usable. Photographic illustrations.

Write to Economy Buildings, Inc., Dept. C&E, P. O. Box 367, West Chicago, Ill., or use the Request Card at page 18. Circle No. 108.

**Job cost control**—a brochure detailing the features of Burroughs contractor accounting systems. Tells how this system handles a variety of work including timekeeping, job cost, payroll, and subcontractor records. Well illustrated with close-ups of various kinds of ledgers.

Write to the Burroughs Corp., Dept. C&E, 6071 Second Ave., Detroit 32, Mich., or use the Request Card at page 18. Circle No. 89.

**Pocket transit**—an illustrated folder describing the Brunton pocket transit. According to the literature, this handy unit shows direction to one degree, as well as level, slope, or grade within one degree.

Write to Wm. Ainsworth & Sons, Inc., Dept. C&E, 2151 Lawrence St., Denver 5, Colo., or use the Request Card at page 18. Circle No. 75.

**Pipe tools**—a booklet describing the comprehensive Beaver line of pipe tools. Well illustrated, with brief specifications given for each item. Catalog No. 60.

Write to Beaver Pipe Tools, Inc., Dept. C&E, Warren, Ohio, or use the card at page 18. Circle No. 115.

**Self-priming pump**—a fact sheet on the McGowan Model 8H portable self-priming pump featuring a maximum capacity of 2,400 gpm at a 60-foot head. Brief specifications furnished. Bulletin No. 602E.

Write to McGowan Pump Division, Leyman Mfg. Corp., Dept. C&E, 3400 Central Parkway, Cincinnati 25, Ohio, or use the Request Card that is bound in at page 18 of this issue. Circle No. 144.

**Excavator cabs**—a fact sheet on Crenlo cabs for Traxcavator Models 933, 955, and 977. Discusses such benefits as safety design, improved visibility, maximum ventilation, and op-

erator comfort. Specifications are given. Form No. 12052.

Write to Crenlo, Inc., Dept. C&E, 1600 Fourth Ave. N. W., Rochester, Minn., or use the Request Card that is bound in at page 18 of this issue. Circle No. 97.

**Tractors, loaders**—a catalog listing and illustrating most major products of The Elmco Corp. Includes pictures and short descriptions of the firm's lines of tractors, loaders, and other equipment. Booklet AP-20.

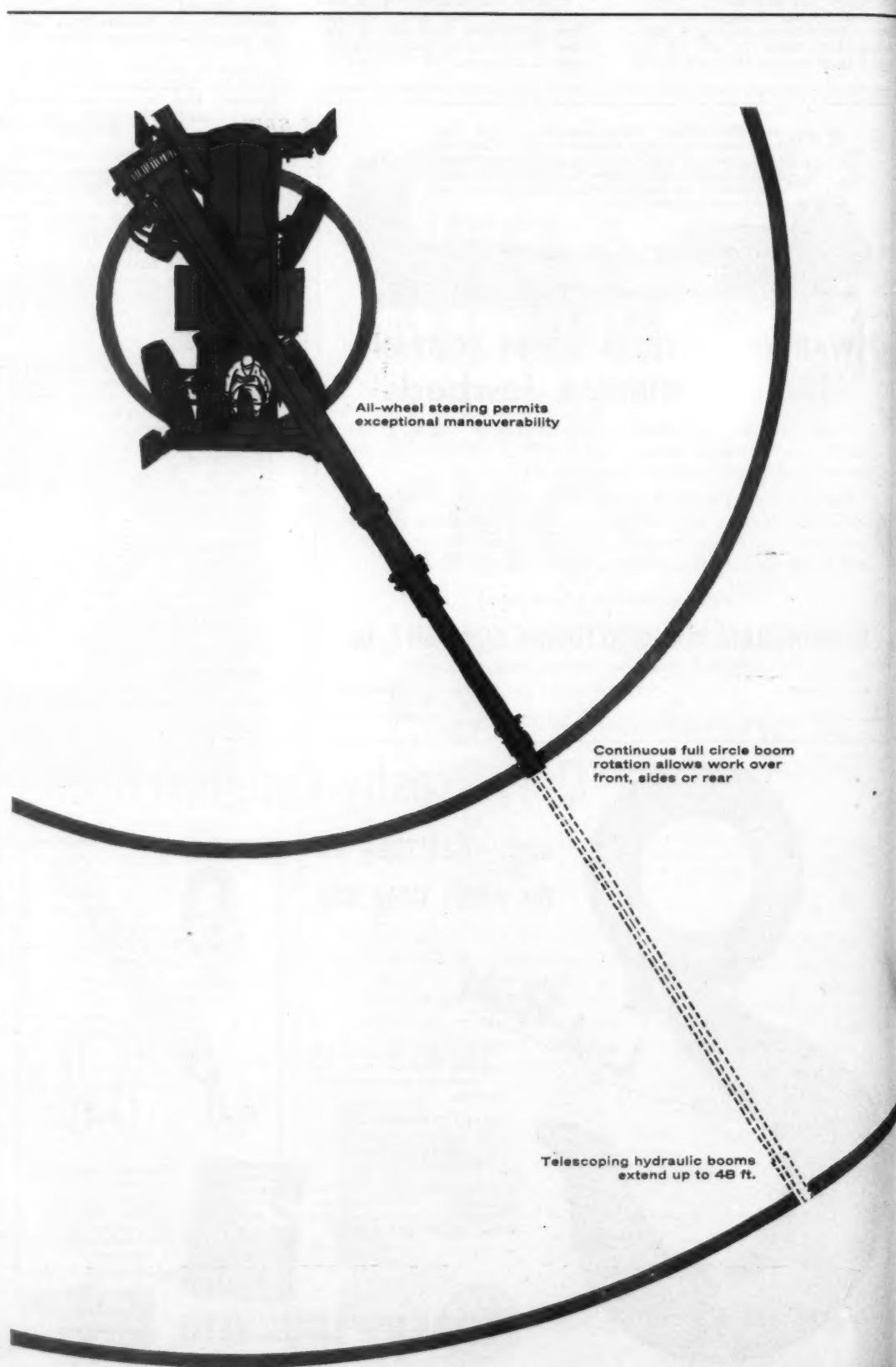
Write to The Elmco Corp., Dept. C&E, P. O. Box 300, Salt Lake City 10, Utah, or use the Request Card at page 18. Circle No. 46.

**Rubber hose**—a catalog describing Continental Rubber's contractors' hose for water and/or sand suction (sizes 1½ through 12 inches). Also gives information on protective clothing.

Write to the Continental Rubber Works, Dept. C&E, 1902 Liberty St., Erie, Pa., or use the Request Card that is bound in at page 18. Circle No. 204.

**Jacks, pullers**—literature describing and illustrating the broad Simplex line of hydraulic jacks and pullers. Data on accessories. Helpful charts. Hydraulic catalog No. 60.

Write to Templeton, Kenly & Co.,



Dept. C&E, 16th and Gardner Road, Broadview, Ill., or use the Request Card at page 18. Circle No. 101.

**Tractor attachments**—a pamphlet illustrating and describing Fleco land-clearing attachments for Caterpillar crawler tractors. Rakes for various applications, tree cutters, and stumpers are among the many items listed. Form No. DAE-6056.

Write to the Fleco Corp., Dept. C&E, P. O. Box 2370, Jacksonville, Fla., or use the Request Card at page 18. Circle No. 159.

**Cone crushers**—a handbook to aid users of Symons cone crushers in securing best performance and maximum efficiency. Discusses some of the common problems encountered in crusher operation. Good and bad crushing practices are outlined with the assistance of installation photographs.

Write to the Nordberg Mfg. Co., Dept. C&E, 3073 S. Chase Ave., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 249.

**Backhoes**—a folder on Yumbo hydraulic backhoe-loaders featuring full clockwise and anticlockwise rotation. According to the literature, these machines can dig to a depth of 13½ feet, can push or pull in backfilling, and attachments can be changed by one man in 10 minutes. Data on a variety of attachments. Photos and drawings.

Write to the Hydraulic Equipment & Shovel Co., Dept. C&E, Box 36, Pearland, Texas, or use the Request Card that is bound in at page 18. Circle No. 10.

**Pile hammers**—a well illustrated bulletin on Vulcan's line of steam, air, and open-type pile hammers. Complete specifications and replacement-parts list, plus descriptions of components and accessories. Full-page diagram shows assembly of all parts,

making replacement easier. Bulletin 70-F.

Write to the Vulcan Iron Works, Inc., Dept. C&E, Riverside Drive and Stewart St., Chattanooga, Tenn., or use the Request Card at page 18. Circle No. 185.

**Conveyor-belt fasteners**—a folder discussing Flexco hinged conveyor-belt fasteners for belts of various thicknesses. Also contains data on the tools necessary for application. Photographs. Bulletin No. HF-502.

Write to the Flexible Steel Lacing Co., Dept. C&E, 4656 Lexington St., Chicago 44, Ill., or use the Request Card at page 18. Circle No. 71.

**Scrapers, trucks, graders**—an illustrated catalog detailing the benefits of Tournapull scrapers, Haulpak dumpers, as well as motor graders and other LeTourneau-Westinghouse equipment. General specifications. Form No. G-1234-Dom.

Write to the LeTourneau-Westinghouse Co., Dept. C&E, 2301 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 156.

**Vibrating roller**—a specification sheet on the Essick Model VR-28-R vibrating compactor. With this unit, 1,500 pounds is said to produce 94 tons of compaction force. Photographs and specifications. Form 4-L-55.

Write to the Essick Mfg. Co., Dept. C&E, 1950 Santa Fe Ave., Los Angeles 21, Calif., or use the Request Card at page 18. Circle No. 41.

**Gravel-testing device**—an illustrated bulletin on the new Porta-Screen gravel-testing device for determining the size of test samples of crushed stone, sand, gravel, or slag. Fully describes the construction of the Porta-Screen, explains its operation and capacities, and lists its many applications.

Write to Solltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 35.

**Tire demounter**—an illustrated fact sheet on the Super Bos portable, lightweight hydraulic tire demounter. States the literature, this unit handles all types of rims and truck tires in sizes from 15 to 24 inches. Can be used on the road or in the shop. Price information.

Write to the Everhot Mfg. Co., Dept. C&E, 51 S. 19th Ave., Maywood, Ill., or use the Request Card at page 18. Circle No. 107.

**Concrete equipment**—a catalog covering many units of Stow concrete equipment, including vibrators, grinders, trowels, and screeds. Illustrated instructions on how to build your own screed. Accessory data. Catalog No. 580.

Write to the Stow Mfg. Co., Dept. C&E, 443 State St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 196.

**Precision test gages**—a bulletin on Martin-Decker precision test gages. Features include accurate calibration from zero to capacity; movement calibrated to dial-uniform increments; and compact design. Photos, dimensional drawings, general specifications. Bulletin M-28B.

Write to the Martin-Decker Corp., Dept. C&E, 3431 Cherry Ave., Long Beach 7, Calif., or use the Request Card at page 18. Circle No. 111.

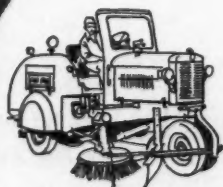
**Scraper**—a catalog describing the V-power B Tournapull. Details on the GM 430-hp 12V-71 engine, transmission, and other components illustrated with photographs and drawings. Fast-loading features of the 29-yard-heaped-capacity scraper and the positive-traction power-transfer differential are fully described. Stresses the use of this B Tournapull as a tandem unit capable of moving up to 58 yards of dirt per cycle.

Write to the LeTourneau-Westinghouse Co., Dept. C&E, 2301 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 156.

## AUSTIN-WESTERN PRODUCTS SAVE TIME AND MONEY

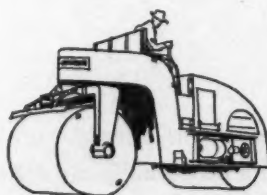
# LIFT, CARRY AND PLACE IN AREAS WHERE OTHER CRANES CANNOT WORK

Tight, cramped working quarters and low overhead clearances pose no problem for Austin-Western hydraulic cranes. Because they've got the easy maneuverability of all-wheel steering *plus* long reach and big load capacity. Telescoping booms swing in continuous full circle on most models; extend to maximum 48-ft. length on Model 410. Safe, precise, easy to operate. Rubber-mounted, they work indoors or out equally well—most travel at speeds to 35 mph. A-W owners tell us they're perhaps *the* most useful multi-purpose pieces of equipment you can buy. They do just about everything . . . from plant maintenance or construction equipment repair to materials handling tasks. And they can be even more useful equipped with clamshell, dozer blade, snow plow, magnet, personnel platform, or other attachments. They come in 5 models—capacity ranges up to 11 tons; self-propelled, truck or stationary mountings. Learn just how profitable an A-W would be in your operation. Get facts from our distributor or write us direct.



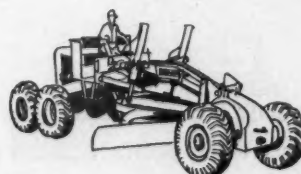
**A-W MOTOR SWEEPERS**

2 models: 2-yd. Model 40; 4-plus yd. Model 60. Safe, easy front steer; full visibility. Simplified design; broom and hopper in rear.



**A-W COMPACTION EQUIPMENT**

Variable weight tandem and 3-wheel rollers to 14 tons; 3½-6 ton portable tandem; Roller-Compactor; vibratory attachment for most 3-wheel rollers.



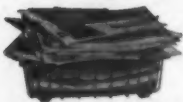
**A-W POWER GRADERS**

9 models; all-wheel drive and steer 4-wheel Pacers and 6-wheel Supers. Weight classifications to 30,000 lb., power ranges to 165 hp.

**Austin-Western** CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.  
**BALDWIN · LIMA · HAMILTON**



For more facts, use Request Card at page 18 and circle No. 294



house Co., Dept. C&E, 2301 N. E. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 67.

**Form-stripping products**—literature on Industrial Synthetics' products for easy stripping and cleaning of forms. Furnishes data on drum sizes and gives price information.

Write to the Industrial Synthetics Corp., Dept. C&E, 2000 W. Walnut St., Chicago 12, Ill., or use the Request Card at page 18. Circle No. 158.

**Scaffolding**—a booklet on Superior Auto-Lock tubular-steel scaffolds. Separate section on shoring for concrete construction. Component specifications. Illustrated.

Write to the Superior Scaffold Co., Dept. C&E, 5624 Bankfield Ave., Culver City, Calif., or use the Request Card at page 18. Circle No. 112.

**Portable steamer**—illustrated literature on the Cleaver-Brooks Model PS-50 high-capacity steamer. Stresses the versatility of the unit, listing such applications as thawing, heating, cleaning, and steam supply for pile driving and aggregate dryers in asphalt plants.

Write to the Cleaver-Brooks Co., Dept. C&E, 326 E. Keefe Ave., Milwaukee 12, Wis., or use the Request Card at page 18. Circle No. 76.

**Air-powered borer**—a bulletin on the Ka-Mo Model A295 air-powered boring unit featuring a range from 125 feet of 8-inch-diameter hole to 50 feet of 30-inch-diameter hole—vertical, angular, and horizontal boring. Capacity chart, photos of field applications. Discusses various types of cutting heads.

Write to the Kwik-Mix Co., Dept. C&E, 235 W. Grand Ave., Port Washington, Wis., or use the Request Card at page 18. Circle No. 6.

**Pumps**—literature on Fairbanks-Morse Adapt-Able pumps. Pump mounting dimensions are standardized with similar dimensions of NEMA-driving motors, states the literature. Also points out that installation, change, or maintenance of pump or motor is swift, easy, on-the-spot. Photographs.

Write to Fairbanks, Morse & Co., Dept. C&E, 600 S. Michigan Ave., Chicago 5, Ill., or use the Request Card at page 18. Circle No. 72.

**Concrete additives**—a folder on Placewel and Retardwel, two liquid admixtures for concrete. Describes the advantages of Placewel for water reduction and Retardwel for control of setting and water reduction. Charts, tables, suggested specifications. Brochure CA-6A.

Write to the Johns-Manville Corp., Cement Additives Unit, Dept. C&E, 22 E. 40th St., New York 16, N. Y., or use the Request Card at page 18. Circle No. 2.

**Fittings for chain, wire rope**—a catalog on the wide variety of Crosby-Laughlin and Lebus drop-forged fittings for wire rope and chain. Contains many illustrations, both photographs and drawings. Specifications included. Catalog No. 950-2.

Write to the Crosby-Laughlin Division, American Hoist & Derrick Co., Dept. C&E, P. O. Box 570, Fort Wayne, Ind., or use the Request Card at page 18. Circle No. 86.

**Universal joints, drives**—a catalog on Neapco light, medium, and heavy-duty universal joints for applications ranging from hand-operated slow-speed power-driven uses through truck and tractor power-takeoff drives. Text illustrated with drawings and photographs.

Write to Neapco Products, Inc., Dept. C&E, Pottstown, Pa., or use the Request Card at page 18. Circle No. 198.

**Radiotelephones**—an illustrated specification sheet describing the Pearce-Simpson CBD line of radiotelephones available in single and multi-channel models. Price data for three models.

Write to Pearce-Simpson, Inc., Dept. C&E, 2295 N.W. 14th St., Miami 35, Fla., or use the Request Card at page 18. Circle No. 162.

**Slurry-seal spreader**—a fact sheet discussing the Tarco slurry-seal spreader. Features: adjustable sealing widths, steel runners, sprinkling system, preleveling board, composition strike-off blade, and many others. Application data included. Illustrated with photographs.

Write to the Tarrant Mfg. Co., Dept. C&E, 27 Jumel Place, Saratoga Springs, N. Y., or use the Request Card at page 18. Circle No. 113.

**Forms for prestressing**—literature describing Economy steel forms for precast or prestressed concrete. Discusses forms for casting standard AASHTO beams, for special prestressed-concrete jobs, and for miscellaneous precast units. Drawings and photographs.

Write to the Economy Forms Corp., Dept. C&E, P. O. Box 128, Highland Park Station, Des Moines, Iowa, or use the Request Card at page 18. Circle No. 155.

**Pumps**—an informative engineering manual on Marlow pumps. Contains 24 pages of indexed information, charts, and graphs. Manual EM-60.

Write to Marlow Pumps, division of Bell & Gossett Co., Dept. C&E, P. O. Box 200, Midland Park, N. J., or use the Request Card at page 18. Circle No. 186.

**Tamper**—a fact sheet on the Wacker Rammer Model GVR 100-C, a lightweight compactor for all kinds of backfill including clay. Contains photos and specifications for this powerful, one-man-operated unit.

Write to the Wacker Corp., Dept. C&E, Hartford, Wis., or use the Request Card at page 18. Circle No. 131.

**Crushing, handling equipment**—a catalog, with photographs, on the Diamond line of crushing and handling equipment. Includes stationary and portable crushing plants, jaw and roll crushers, vibrating screens, conveyors, feeders, storage bins, scalpers, scrubbers, etc. Catalog D-106.

Write to the Diamond Iron Works, division of the Goodman Mfg. Co., Dept. C&E, Halsted St. and 48th Place, Chicago 9, Ill., or use the Request Card at page 18. Circle No. 205.

## THE USEFULNESS OF A LIMA AUSTIN-WESTERN

# ONE MAN RUNS THIS PORTABLE PUSHBUTTON CRUSHING PLANT



Only one man is required to operate this Lima Austin-Western portable crushing and screening plant. From his operating platform he can see and control every phase of this efficient, high-speed setup. Diesel engine operates crushers; electric generator powers all other operations. Design simplicity eliminates troublesome clutches, chains, sprockets and gearboxes. Maintenance is reduced, tonnage costs are kept down.

And look at the compactness of this completely portable unit. It's self-contained, rubber mounted—ready to roll from job to job. Works near end-use sites to cut trucking time and costs. Lima Austin-Western offers a full line of portable or stationary crushing, screening and washing equipment, including jaw crushers, roll crushers, feeders, screens, elevators, conveyors and bins. To see it in action, get in touch with our distributor nearest you or write to us for full details.

4102

**Rods for prestressing**—a pamphlet on Stressrods—high-tensile alloy steel bars for prestressed concrete. Describes in detail the Stressrods system. Covers services, equipment, costs, application data. Exceptionally well illustrated with photographs, drawings, graphs, and charts. Catalog No. SR-4.

Write to Rods, Inc., Dept. C&E, 706 Folger Ave., Berkeley 10, Calif., or use the Request Card at page 18. Circle No. 138.

**Tractor shovel**—a fact sheet illustrating and describing the Speedall Model PM-240 rubber-tire tractor shovel. Lists such features as power-shift transmission, 40-degree bucket rollback at ground level, and excellent operating visibility. Dimensional

drawing of the machine with a 1 3/4-yard bucket. Bulletin P-580.

Write to the Pettibone Mulliken Corp., Dept. C&E, 4700 W. Division St., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 103.

**Slide rules**—a catalog describing several models of Pickett all-metal slide rules. According to the literature, these rules offer accuracy to plus or minus .000275 inch. Photographs, price information.

Write to Pickett & Eckel, Inc., Dept. C&E, 1109 S. Fremont, Alhambra, Calif., or use the Request Card at page 18. Circle No. 188.

**Heated roller**—a specification sheet on the Ken-Pave hand-operated heated compaction roller for small jobs and patching. According to the literature, this unit gives heated com-

paction equal to a 5-ton power roller.

Write to the Pfahler Mfg. Co., Dept. C&E, R. D. 3, Gallon, Ohio, or use the card at page 18. Circle No. 109.

**Concrete admixture**—literature describing how early form stripping, reduced shrinkage and cracking, lower permeability, and increased bond strength were achieved with the aid of Pozzolith in the concrete for the Sandy Ridge Tunnel in Virginia. On-the-job photographs. Bulletin P-77.

Write to The Master Builders Co., Dept. C&E, 2490 Lee Blvd., Cleveland, Ohio, or use the Request Card at page 18. Circle No. 3.

**Forms**—a brochure describing and illustrating Atlas Compo concrete forms. Emphasizes simplicity of assembling and stripping, as well as

such features as rugged yet lightweight construction, simple tie system, and ability to form structures of practically any shape.

Write to the Irvington Form & Tank Corp., Dept. C&E, 100 William St., New York 38, N. Y., or use the Request Card at page 18. Circle No. 52.

**Dumper**—illustrated literature describing the Mack Model M 30-ton dumper for extra-heavy-duty work in quarrying and construction. This unit comes as a 4-wheel-dumper chassis.

Write to Mack Trucks, Inc., Dept. C&E, 900 North Ave., Plainfield, N. J., or use the Request Card at page 18. Circle No. 197.

**Floodlights**—a brochure describing and illustrating the Trav-A-Lite self-contained, portable tower floodlight. Lists such features as easy operation, choice of generators, and trailer or skid mounting. Brief specifications.

Write to The Rig-A-Lite Co., Inc., Dept. C&E, 2102 69th St., Houston 11, Texas, or use the Request Card at page 18. Circle No. 68.

**Excavators**—a booklet detailing the construction and operating characteristics of the Lima line of shovels, cranes, draglines, and Roadpacker vibratory compactors. Photographs and specifications for all equipment described. Bulletin No. CL-60S.

Write to the Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Dept. C&E, Lima, Ohio, or use the Request Card at page 18. Circle No. 145.

**Diesel engines**—an illustrated brochure discussing Sheppard diesel engines in capacities from 8 to 88 horsepower. Photographs, dimensional drawings, power curves and specifications. Bulletin No. A-106-A.

Write to R. H. Sheppard Co., Inc., Dept. C&E, 101 Philadelphia St., Hanover, Pa., or use the Request Card at page 18. Circle No. 176.

**Transmissions**—a brochure on Cotta heavy-duty transmissions, which are customized to meet individual requirements. Discusses the engineering service offered and supplies information on ordering. Photos, drawings.

Write to the Cotta Transmission Co., Dept. C&E, 2300 Eleventh St., Rockford, Ill., or use the Request Card at page 18. Circle No. 82.

**Vibrators**—a folder describing and illustrating all models in the Dart line of concrete vibrators. Also offers data on the Viking Model V3-35, 3-in-one troweling machine.

Write to the Dart Mfg. Co., Dept. C&E, 1002 S. Jason St., Denver 23, Colo., or use the Request Card at page 18. Circle No. 84.

**Conveyor-belt splice**—a bulletin on the design and application of Wedlok splice for conveyor and elevator belts. Points out that this splice is easy and quick to install, with no special tools needed. Charts and drawings. Form No. M-380.

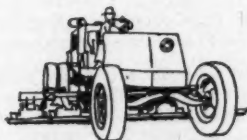
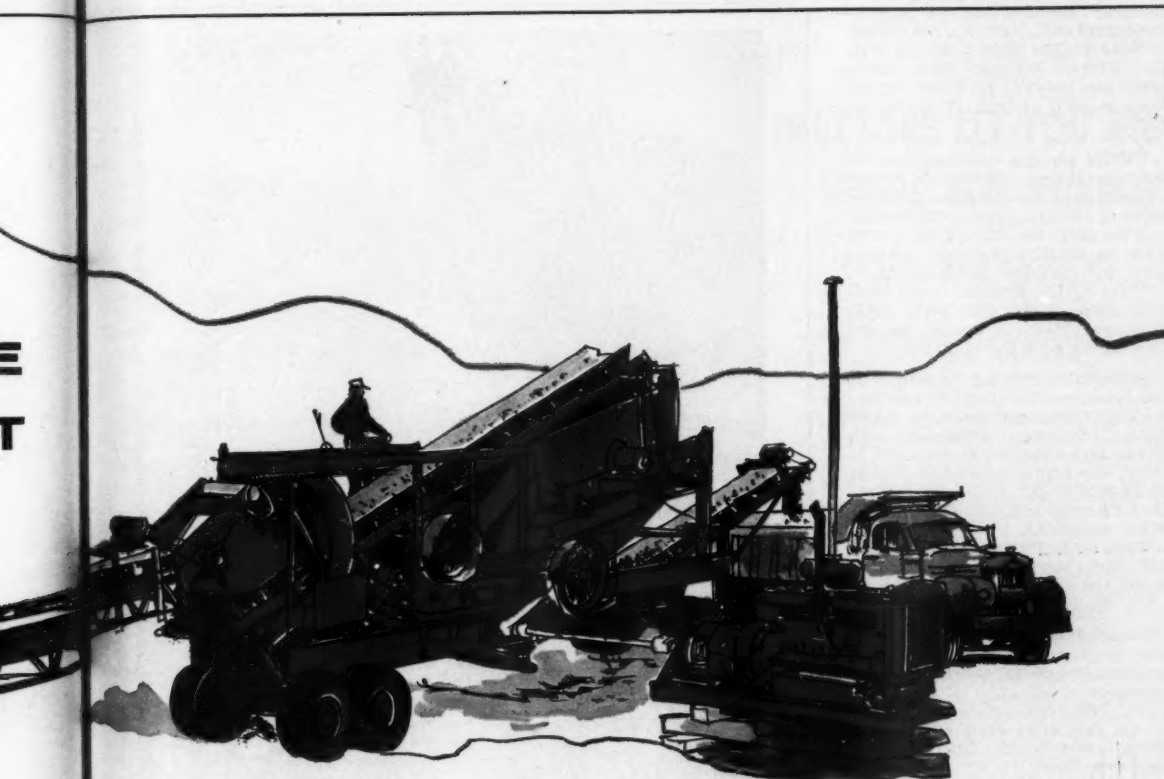
Write to Raybestos-Manhattan, Inc., Manhattan Rubber Division, Dept. C&E, 61 Willett St., Passaic, N. J., or use the Request Card at page 18. Circle No. 202.

**Materials-testing equipment**—literature describing Rainhart materials-testing equipment. Covers a wide range of equipment and is illustrated with photographs, drawings.

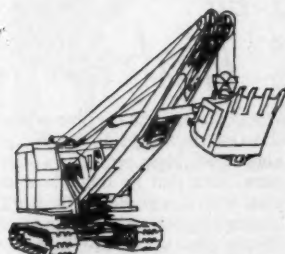
Write to the Rainhart Co., Dept. C&E, P. O. Box 4065, Austin 51, Texas, or use the Request Card at page 18. Circle No. 183.

**Rubber hose**—a catalog describing the Republic line of rubber hose for air, steam, water, suction, and special applications. Includes information on hose couplings and accessories. Alphabetical listing of items described.

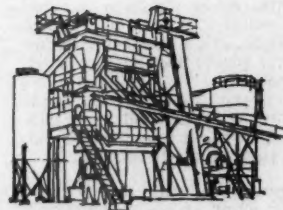
Write to the Republic Rubber Di-



**LIMA MODEL D ROADPACKER**  
—Six vibrating shoes compact fast and deep for profitable single-course construction; available in 12-shoe Super model.



**LIMA SHOVELS AND CRANES**  
—Interchangeable front ends. Shovels to 8 yd.; cranes to 140 tons on crawlers, 80 tons on rubber; draglines variable.



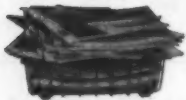
**LIMA MADSEN ASPHALT PLANTS**  
—available in models with batching capacities from 1000 to 10,000 lb.

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**LIMA AUSTIN-WESTERN** Crushing, Screening and Washing Equipment  
**BALDWIN · LIMA · HAMILTON**  
CONSTRUCTION EQUIPMENT DIVISION · LIMA, OHIO



For more facts, use Request Card at page 18 and circle No. 295



vision, Lee Rubber & Tire Corp., Dept. C&E, Youngstown, Ohio, or use the Request Card at page 18. Circle No. 201.

**Roller**—an illustrated circular on the Ferguson 35-ton self-propelled rubber-tire compactor. All-wheel oscillation is stressed. Condensed specifications; tire and pressure data.

Write to the Shovel Supply Co., Inc., Dept. C&E, Box 1369, Dallas 21, Texas, or use the Request Card at page 18. Circle No. 135.

**Spreader**—an illustrated pamphlet on the Hi-Way Model E spreader designed for a wide variety of work. Types shown include truck-mounted, PTO-powered; truck-mounted, engine-powered; and dump-body-

mounted, engine-powered. Information on optional equipment; general specifications.

Write to the Highway Equipment Co., Dept. C&E, 616 D Ave. N.W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 128.

**Forms, accessories**—a 56-page catalog covering the Universal Form Clamp line of concrete forms, form ties, and a wide range of related accessories. Well illustrated with drawings, on-the-job photographs, and close-ups of major components. Catalog No. 759.

Write to the Universal Form Clamp Co., Dept. C&E, 1238-48 N. Kostner Ave., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 92.

**Tractor shovel**—literature describing and illustrating the Trojan Model LHM-75 tractor shovel featuring Safety Curve lift arms. Contains complete specifications for this 1-cubic-yard unit. Form No. DW-20R-2.

Write to The Yale & Towne Mfg. Co., Trojan Division, Dept. C&E, Main St., Batavia, N. Y., or use the Request Card at page 18. Circle No. 132.

**Utility pumps**—a folder describing the Bennett Series 57 electric utility pumps. Also describes the three types of counters offered. Mechanical and operating features of the pumps given in detail, along with illustrations and complete specifications.

Write to the Bennett Pump Division, John Wood Co., Dept. C&E, Muskegon, Mich., or use the Request Card at page 18. Circle No. 70.

**Material-handling equipment**—a brochure describing Pitman hydraulic, truck-mounted lifting equipment. Profusely illustrated with photos and dimensional drawings. It covers the firm's Hydra-Lift Models 50, 60, and 60-HB. Detailed specifications for each machine. Data on optional equipment.

Write to the Pitman Mfg. Co., Dept. C&E, P. O. Box 571, Grandview, Mo., or use the Request Card at page 18. Circle No. 140.

**Diesel-fuel conditioner**—literature on the Diesel Pep diesel-fuel conditioner said to improve the performance of all types of diesel engines. Furnishes detailed directions for use. Also gives information on the firm's roller-chain Dri-Loob and open-gear Loob.

Write to the Spray Products Corp., Dept. C&E, P. O. Box 1988, Camden 1, N. J., or use the Request Card at page 18. Circle No. 123.

**Concrete mixer**—literature giving details and specifications on the Rex Model 6S mixer, a 6-cubic-foot unit with many features including low center of gravity, lightweight construction, and a choice of gasoline or electric power. Specification Sheet No. 60-6S.

Write to the Chain Belt Co., Dept. C&E, 4701 W. Greenfield Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 190.

**Wellpoint systems**—a new catalog, with many on-the-job pictures, describing Moretrench equipment. Shows many types of projects where predrainage by Moretrench wellpoint systems has cut costs and helped solve construction problems. Catalog No. 1000.

Write to the Moretrench Corp., Dept. C&E, 389 Main St., Rockaway, N. J., or use the Request Card at page 18. Circle No. 38.

**Sign standard**—an illustrated fact sheet describing the Commando multipurpose sign standard for temporary, regulatory, warning, and guide signs. Said to be adaptable, sturdy, convenient to use, easy to store.

Write to the G. D. Bavin Co., Dept. C&E, 2500 W. Sixth St. Bldg., Los Angeles 57, Calif., or use the Request Card at page 18. Circle No. 90.

**Hardfacing electrode**—a brochure on the Stooddy 2134 hardfacing electrode for crushing and earthmoving equipment, and for other parts subject to severe abrasion and impact. Lists physical properties, recommended applications, and gives data on rod types, sizes, and weight.

Write to the Stooddy Co., Dept. C&E, 11904 E. Slauson Ave., Whittier, Calif., or use the Request Card at page 18. Circle No. 177.

**Battery-powered winch-hoist**—information on the My-te battery-powered winch and hoist. Lists major construction and operating features, and illustrates many of the uses to which the unit can be put.

Write to the City Engineering Co., Inc., Dept. C&E, 3547 Massachusetts Ave., Indianapolis, Ind., or use the Request Card at page 18. Circle No. 99.

**Winches**—literature describing a wide variety of Beebe winches in capacities from ½ ton to 15 tons. Also gives information on ratchet and electric hoists. Drawings, photos, specifications. Catalog No. SC-4.

Write to the Beebe Bros. Mfg. Co., Dept. C&E, 2724 Sixth Ave. S., Seattle 4, Wash., or use the Request Card at page 18. Circle No. 65.

**Base-mix units**—a pamphlet detailing the construction and operating characteristics of Peerless portable stabilized-base-mix units. Features two basic models: the bin unit type and the portable-conveyor unit type. Bulletin SBM-1160.

Write to the Peerless Conveyor & Mfg. Co., Inc., Dept. C&E, 3341 Harvester Road, Kansas City 15, Kans., or use the Request Card at page 18. Circle No. 121.



## POKER? Play to win!

### How would you play these hands?

In coming months we'll discuss how most "experts" (steady winners) would play the above hands in draw poker, jacks or better to open, 6 or 7 players in the game.

Every hand involves some basic principle of good poker playing. Simple rules, but ones which are most often violated by most good losers. Of course, following the rules is no guarantee you'll win. But, you should win more often.

Ford is not recommending that you gamble. But if you do play poker for money, chalk or marbles... or for that matter, just for the fun of it, you'll probably enjoy the game even more when winning.

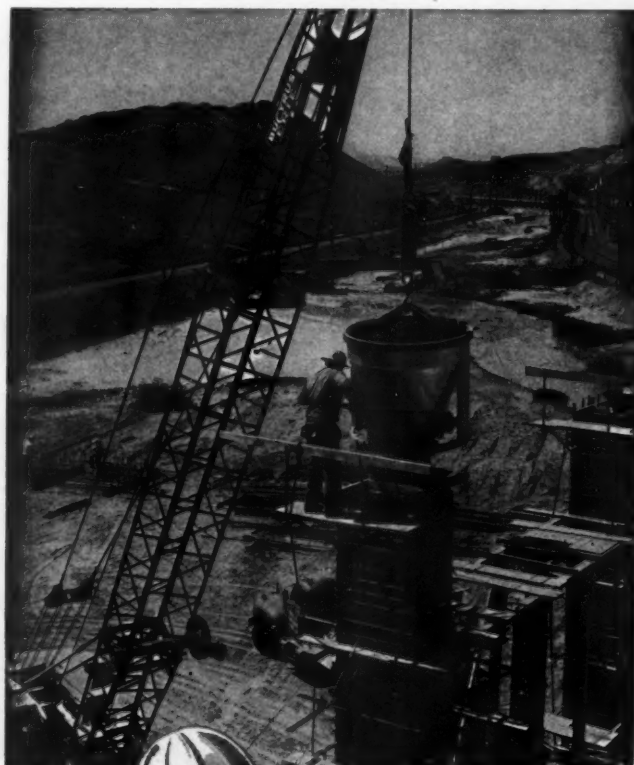
In the same series, we'll be telling you of another way to win with Ford, and with no gamble at all: simply by using Ford tractors and equipment to help solve the problems of your job.

Next month, for instance, we'll announce a cash-money offer which so far as we know has never before been made in this field. Watch for it. It could be worth more to you... well, maybe more... than a royal flush!

Tractor and Implement Div.,  
Ford Motor Company,  
Birmingham, Michigan



For more facts, circle No. 296



Here's  
an  
Idea!

## GAR-BRO helped cut costs in pouring concrete piers!

One contractor cut the time in placing concrete on this bridge job by planning ahead. Here, on these two bridge piers, note that he used three complete units comprised of Gar-Bro Collection Hopper and a string of Steel Chutes plus a Gar-Bro Bucket. He used the hopper and chutes to direct the concrete into the forms and prevent segregation.

His object was to prevent any delays by using one hopper and chute unit to place concrete in one pier, while the second one was set in place in the other pier, and the third one (see it hanging in rack between piers) was being shortened. Delays of transit mixers and the crane were minimized by rotating the hopper and chute units and shortening the chute line to the new level of the concrete in each pier.

It's a good idea to team up your Gar-Bro Concrete Handling Equipment to save time and cut costs.

See your Gar-Bro dealer or write for Catalog and Concrete Handling Manual today!

Gar-Bro Mfg. Co. — Los Angeles, Calif.—Peoria, Ill.

General Offices: 2415 E. Washington Blvd., Los Angeles 21, Calif.



# GAR-BRO

The World's Most Complete Line of  
CONCRETE HANDLING  
EQUIPMENT

For more facts, use Request Card at page 18 and circle No. 297

CONTRACTORS AND ENGINEERS

**Bin batchers**—a bulletin on Engineered Equipment bin batchers for plants and job-site mixer charging. Standard batcher specifications. Data on interchangeable traveling weighers. Photos and dimensional drawings. Bulletin BE 1-60.

Write to Engineered Equipment, Inc., Dept. C&E, 1001 Linden Ave., Waterloo, Iowa, or use the Request Card at page 18. Circle No. 61.

**Diesel-engine starting**—an illustrated fact sheet on the Turner Quick-Start system said to offer controlled fast starts of diesel engines in temperatures to 65 degrees below zero. Three models discussed. Also contains information on Quick-Start starting fuel. Form No. SC-186A.

Write to the Turner Corp., Dept. C&E, 821 Park Ave., Sycamore, Ill., or use the Request Card at page 18. Circle No. 164.

**Dumpy levels, transit**—a specification sheet on the Eagle Nos. 18D and 15D2 dumpy levels—18-inch and 15-inch units, respectively. Also describes and illustrates the Eagle 6-inch transit.

Write to the Texas-Asiatic Import Co., Dept. C&E, 2127 Fort Worth Ave., Dallas, Texas, or use the Request Card at page 18. Circle No. 212.

**Sling chains, hooks**—an illustrated catalog, with specifications, describing the Columbus McKinnon Herc-Alloy line of sling chains and hooks. Furnishes information on the care, use, and inspection of chains. Catalog No. 100C.

Write to the Columbus McKinnon Chain Corp., Dept. C&E, 6067 Fremont Ave., Tonawanda, N. Y., or use the Request Card at page 18. Circle No. 214.

**Masonry scaffolding**—a brochure on Morgen adjustable masonry scaffolding. Furnishes hints on how to figure a scaffolding job. Text illustrated with sketches and photos. Bulletin MS-12.

Write to the Morgen Mfg. Co., Dept. C&E, 1115 N. Broadway, Yankton, S. Dak., or use the Request Card at page 18. Circle No. 209.

**Oils**—a technical bulletin offering data and recommended use for 11 straight-distilled Sun Circo oils with viscosities ranging from 55 SUS at 100 F to 140 SUS at 210 F.

Write to the Sun Oil Co., Industrial Products Dept., Dept. C&E, 1808 Walnut St., Philadelphia 3, Pa., or use the Request Card at page 18. Circle No. 33.

**Power saws**—a folder on the Wright Model 2016 (16-inch) and the Model 5020A (20-inch) power-blade saw. Photographs stress versatility of the saws. General specifications included. Form No. WS163-660.

Write to Thomas Industries, Inc., Wright Saw Division, Dept. C&E, 207 E. Broadway, Louisville 2, Ky., or use the Request Card at page 18. Circle No. 37.

**Demolition tool**—a folder describing the Duncan hydraulic Roc-Jak for breaking mass concrete and rock. Photos and drawings illustrate the tool's efficiency, and operational procedure is explained. Brief specifications.

Write to the K. O. Duncan Co., Dept. C&E, P. O. Box 504, Boulder, Colo., or use the Request Card at page 18. Circle No. 85.

**Electronic surveying**—literature discussing Geodimeter Models 2, 3, and 4, designed to electronically measure unknown distances with maximum accuracy. Supplies summary of characteristics for each model. Also discusses the many applications possible.

Write to The Geodimeter Co., Dept. C&E, 2013 Park Ave., South Plainfield, N. J., or use the Request Card at page 18. Circle No. 206.

**Pile hammers**—a bulletin describing McKiernan-Terry's line of six single-acting pile hammers for steam or air operation. Covers standard attachments, bearing calculation charts, and hammer operation. Bulletin No. 691.

Write to the McKiernan-Terry Corp., Dept. C&E, 100 Richards Ave., Dover, N. J., or use the Request Card at page 18. Circle No. 250.

**Metal specialties**—an illustrated folder listing the complete line of metal specialty products offered by the Commercial Shearing & Stamping Co. Includes both unusual and standard fabricated, welded, and machined metal components. Bulletin 300-P10.

Write to the Commercial Shearing & Stamping Co., Dept. C&E, Box 239, Youngstown, Ohio, or use the Request Card at page 18. Circle No. 83.

**Preventive maintenance**—a brochure describing Magnaflex test systems for automotive overhaul. Discusses several units designed to find cracks, defective parts, and leaks. Form No. 17012-4.

Write to the Magnaflex Corp., Dept. C&E, 7300 W. Lawrence Ave., Chicago 31, Ill., or use the Request Card that is bound in at page 18. Circle No. 200.

**Airless spray equipment**—a fact sheet describing the benefits of DeVilbiss airless spray equipment designed for spray painting without atomization, air, heat, or multiple hose lines. Gives pump specifications for all models. Catalog I-3501-e.

Write to The DeVilbiss Co., Dept. C&E, 300 Phillips Ave., Toledo 1, Ohio, or use the Request Card at page 18. Circle No. 74.

**Conveyor**—literature describing the Barber-Greene Model 362 portable conveyor. Action photos show the versatile unit at work. Close-ups of major components. Accessory information. Bulletin No. 362.

Write to the Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 88.

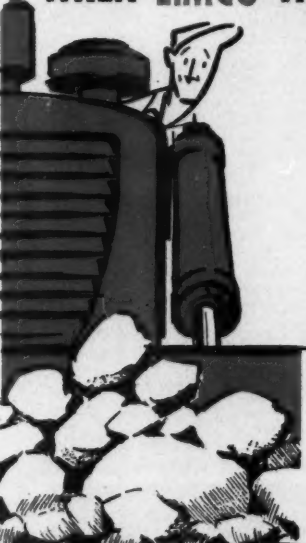
**Backhoes**—a brochure on Wain-Roy backhoes for installation on International TD-6 and TD-9 Series tractors. Drawings stress the benefits of the swing-system design. Diagram illustrates ease of bucket planing. Also gives information on backfill blade counterweight bracket, and 4-pin mounting. Specifications included. Form WR-261.

Write to the Wain-Roy Corp., Dept. C&E, 150 River St., Fitchburg, Mass.,

## WHY TAKE A BACK SEAT . . .

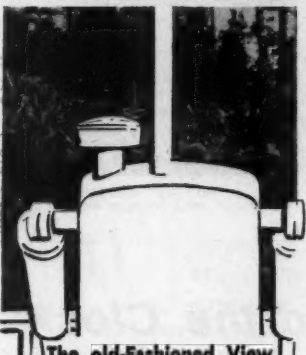
### WHEN EIMCO TRACTORS LET YOU MOVE OUT FRONT

### WHERE YOU BELONG ?




You're out front in more ways than one with the modern Eimco crawler-tractor line!

You operate from a front seat . . . placed where it belongs for real visibility and control, with the heat and noise of the engine behind you. No need to stretch, squirm and squint over and around a yards-long expanse of hood, attachments and overhang to see where you're going. You're right on top of your work with Eimco's common sense up-front operator position, for greater production and work-output, with far less operator fatigue and strain.

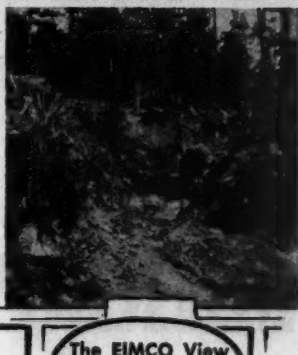


The old-Fashioned View



We don't know why everybody doesn't build tractors this modern, sensible way. But we know that here at Eimco, we had no need to consider old patterns, dies and production machinery when the Eimco crawler-tractor was designed. With seventy-five years experience in designing and building quality equipment, Eimco had the know-how and facilities to build the best and the first really modern line of tractors. Out of this developed a logical series of unique engineering developments and firsts. One of these was Eimco's exclusive up-front operator position.

There are many others, plus a quality of engineering and craftsmanship that has established a record of nearly seventy per cent savings in maintenance costs against any other leading make of crawler-tractor equipment you can buy today!



The EIMCO View

## MOVE UP FRONT . . . WITH AN EIMCO!

Get all the facts and step up your profit and work output with the Eimco line of modern tractors:

Eimco 103    100 HP Diesel    Eimco 105    143 HP Diesel    Eimco 106    205 HP Diesel

TRACTORS • DOZERS • EXCAVATORS • FRONT END LOADERS • LOG LOADERS • SPECIAL STEEL MILL EXCAVATORS AND FRONT END LOADERS

Contact the Eimco dealer or branch nearest you, or write  
The Eimco Corporation, P.O. Box 300, Salt Lake City 10, Utah, U.S.A.

"ADVANCED ENGINEERING AND QUALITY CRAFTSMANSHIP SINCE 1884"

THE EIMCO CORPORATION

EXPORT OFFICE: 51 - 52 SOUTH STREET, NEW YORK, N. Y.

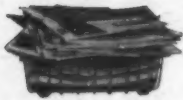
BRANCHES AND DEALERS IN PRINCIPAL CITIES THROUGHOUT THE WORLD

For more facts, use Request Card at page 18 and circle No. 298



TRACTOR LOADER  
DIVISION

634 SOUTH 4TH WEST  
SALT LAKE CITY, UTAH — U.S.A.



or use the Request Card at page 18. Circle No. 167.

**Safety equipment**—a catalog on the Atlas line of safety equipment. Includes such items as safety belts, nets, and lanyards for safety belts and harnesses. Booklet illustrated with photographs.

Write to the Atlas Safety Equipment Co., Inc., Dept. C&E, 179 N. Tenth St., Brooklyn 11, N. Y., or use the Request Card at page 18. Circle No. 79.

**Ready-mix trucks**—a brochure listing the benefits of FWD ready-mix trucks. Emphasizes such features as full-time all-wheel drive, unitized suspension, greater tire economy, and flywheel power takeoff. Illustrated

with photographs. Form No. RM-A1-THON.

Write to the FWD Corp., Dept. C&E, Clintonville, Wis., or use the card at page 18. Circle No. 58.

**Tire valves, fittings**—a catalog on the Dill line of tire valves, tire-valve fittings, and assorted gages and tools for off-the-road equipment. Specifications and photographs. Catalog No. OR-1.

Write to the Dill Mfg. Co., Dept. C&E, 700 E. 82nd St., Cleveland 3, Ohio, or use the Request Card at page 18. Circle No. 142.

**Form coating**—a folder discussing Technicote, a plastic protective coating for preserving plywood forms. This coating is said to be easily applied, quick-drying, and to create a smooth, highly alkali, and moisture-

proof film. Bulletin No. 6-58.

Write to L. J. Kissling & Son, Dept. C&E, P. O. Box 21, Long Island City 1, N. Y., or use the Request Card at page 18. Circle No. 187.

**Floodlights**—a folder on Sturdlite heavy-duty floodlights said to be especially designed to withstand shock and vibration. Describes several models and gives specifications for each.

Write to the Phoenix Products Co., Dept. C&E, 4715 N. 27th St., Milwaukee 9, Wis., or use the Request Card at page 18. Circle No. 182.

**Trencher**—a folder listing and illustrating the features of the Arps Trench-Devil Model L-12, a self-propelled trencher with a maximum depth capacity of 5½ feet and maximum width capacity of 12 inches.

Also discusses accessories for unusual jobs. Form TD-1.

Write to the Arps Corp., Dept. C&E, New Holstein, Wis., or use the Request Card at page 18. Circle No. 195.

**Helicopter**—a folder describing advantages of the Hiller Model 12E helicopter as an aid on a variety of construction projects. According to the literature, its 305-hp engine gives the 12E a useful load of 1,000 pounds.

Write to the Hiller Aircraft Corp., Commercial Division, Dept. C&E, 1350 Willow Road, Palo Alto, Calif., or use the card at page 18. Circle No. 181.

**Adjustable steel shores**—a folder on Acrow adjustable, self-cleaning steel shores. Stresses easy erection and adjustment by one man. Photographs; general specifications.

Write to the Acrow Corp. of America, Dept. C&E, 231 Washington Ave., Carlstadt, N. J., or use the Request Card at page 18. Circle No. 102.

**Bin level indicators**—literature describing and illustrating four models of Bin-Vue bin level indicators. Features listed include: no diaphragm to replace, no lubrication required, ability to operate in any position. Dimensional drawings and photographs.

Write to Convaire, Dept. C&E, P. O. Box 9671, Pittsburgh 26, Pa., or use the card at page 18. Circle No. 96.

**Concrete specialty forms**—a catalog on Ezy-Stryp metal forms, and machinery for a wide variety of concrete specialty products. Includes standard forms, vibrating equipment, and form oil. Catalog No. 3.

Write to the R. L. Spillman Co., Dept. C&E, Box 4167, Columbus 7, Ohio, or use the Request Card at page 18. Circle No. 122.

**Portable heaters**—an illustrated folder on Electro-Jet portable space heaters. Designed to run on regular 110 to 115-volt, 60-cycle ac, these units feature adjustable output, are completely automatic, and burn No. 1 or No. 2 fuel oils.

Write to Electronics, Inc., Dept. C&E, P. O. Box 150, Vermillion, S. Dak., or use the Request Card at page 18. Circle No. 146.

**Off-the-road tires**—illustrated literature detailing the benefits of Goodrich off-the-road tires. Emphasizes the tires' cut-protected (CP) compound said to substantially reduce cutting, chipping, and abrasions. Also discusses the firm's heat-resistant (HR) compound designed to withstand long, high-speed hauls.

Write to The B. F. Goodrich Co., Dept. C&E, 500 S. Main St., Akron 18, Ohio, or use the Request Card at page 18. Circle No. 179.

#### B-E personnel change

■ The Bucyrus-Erie Co., South Milwaukee, Wis., has appointed Robert J. Uriakis sales representative for large machines.

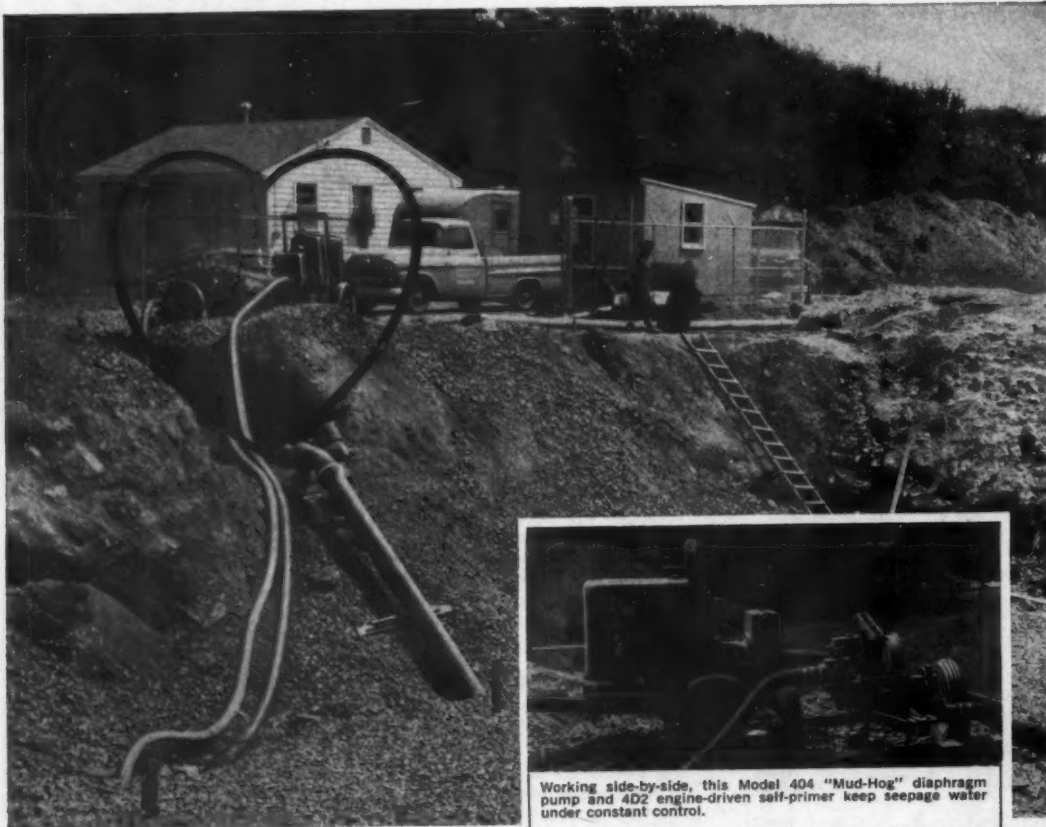
Uriakis, working from B-E's Pittsburgh subregional office, will handle a complete line of large excavating and drilling equipment.

#### Clyde Iron Works names

■ J. E. Rowland and John J. McClanahan have been added to the field sales staff of Clyde Iron Works, Inc., Duluth, Minn.

Rowland will cover the north central states with headquarters in Chicago, and McClanahan will service the southeastern states from headquarters in Birmingham.

### The **HEART** of seepage water control is the **PUMP** on the job!



Working side-by-side, this Model 404 "Mud-Hog" diaphragm pump and 4D2 engine-driven self-primer keep seepage water under constant control.

## MARLOWS Pump "Round the Clock" On Flood Control Project!

The firm of Paino & LaCava is currently working on a \$750,000 "Spot Brook Flood Control" project in Malden and Melrose, Mass. The project calls for building 4,500 feet of open cut area and 1,100 feet of culvert. The open cuts are 40 feet wide at the bottom, 8 to 15 feet deep and 80 feet across at the top. The bottom of the cut was lined with tunnel spoil and then concrete was poured along the sides and the base.

To control seepage water rising up under the lining of spoil and make it possible to pour the concrete, three Marlow pumps were placed in 24-hour service. Two of them were 404 "Mud-Hog" dia-

phragm pumps and the third unit, a 4D2 self-priming, engine-driven pump, was only used when rain and run-off added to the seepage water problem. The pumps were run 24 hours a day — for eight months — without interruption! Jim Dolan, Project Superintendent, in the construction business all his life, best expressed Marlow dependability when he said

"These Marlows were the best pumps I ever used!"

If water's a problem on your next construction job, let Marlow help you solve it. Marlow makes a complete range of AGC rated self-priming and diaphragm pumps.

Write today for Bulletin C-09 and the name of your Marlow dealer.



### MARLOW PUMPS

Division of Bell & Gossett Company  
MIDLAND PARK, NEW JERSEY

Longview, Texas • Morton Grove, Illinois

0-102

For more facts, use Request Card at page 18 and circle No. 299

## Names in the News

W. S. Winslow, assistant chief engineer of bridges for the North Carolina State Highway Commission.



### Highway commission appoints two men

W. S. Winslow has been appointed assistant chief engineer of bridges for the North Carolina State Highway Commission, Raleigh, N. C. He joined the commission in 1923.

James L. Norris will replace Winslow in his former post as hydrographic engineer. He has been assistant hydrographic engineer since 1952.

### Building-trades group names board chairman

H. Earl Fullilove has been appointed chairman of the board of governors of the Building Trades Employers' Association, New York, N. Y. He succeeds Peter W. Eller, who will continue as consultant.



H. Earl Fullilove, chairman of the board of governors, Building Trades Employers' Association, New York City.

Fullilove has served as vice chairman of the board since 1959, when he joined the association. Prior to that, he was director of labor relations and personnel on a national level for the George A. Fuller Co.

### F. H. McGraw elects new vice president

Maurice J. Knopf has been elected vice president of F. H. McGraw & Co., New York, N. Y. For the past two years, he has been general manager of the firm's redevelopment activities, and last February was appointed assistant to the president.

Knopf will continue to be in charge of Constitution Plaza, a \$50 million eight-block reconstruction program in Hartford, Conn. He will also direct the company's interests in other commercial projects.

### Corps appoints division engineer

Brig. Gen. Robert J. Fleming, Jr., has been appointed division engineer of the U. S. Army Corps of Engineers' Southwestern Division, Dallas, Texas. He succeeds Col. Stanley G. Reiff, who has served in the post since the retirement of Brig. Gen. William Whipple in July.

Gen. Fleming formerly served as commanding general, Theater Army Support Command, Europe.

### Engineers Joint Council elects president, veep

James N. Landis has been elected president of the Engineers Joint Council, New York, N. Y., a national association of 21 engineering societies organized to promote cooperation among the various fields of engineering.

Landis is vice president of the Bechtel Corp., San Francisco.

George E. Holbrook was re-elected vice president of the council. He is vice president, director, and a member of the executive committee of E. I. du Pont de Nemours & Co.

### Consulting firm appoints

Frederick L. McAdam has been named chief engineer for Marshall Macklin Monaghan Ltd., consulting engineering firm of Don Mills, Ont., Canada.

The firm is a professional service organization practicing in the fields of civil engineering, town planning, and surveying.

### Contractors' group names

General Building Contractors Association, Inc., Philadelphia, Pa., has appointed Charles B. McBride director of industry relations.

McBride was formerly in business for himself as a manufacturer's representative.

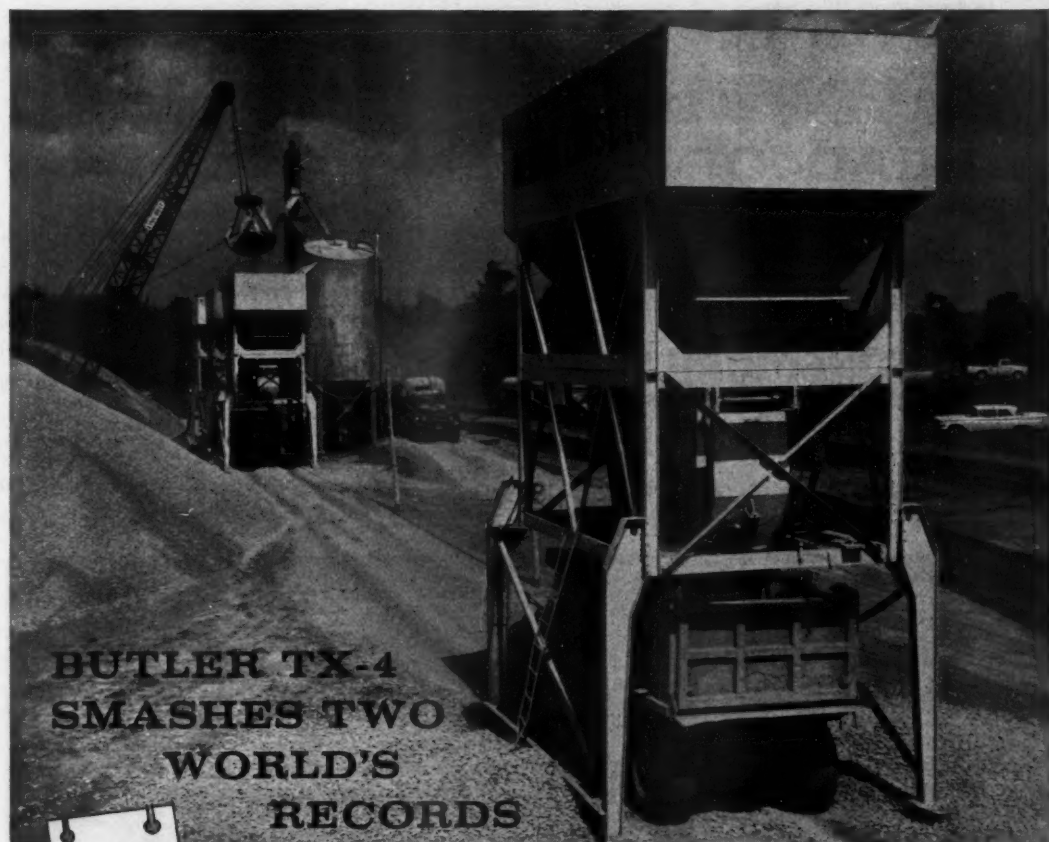
### Wisconsin Highway news

The Wisconsin State Highway Commission, Madison, Wis., has appointed James P. Green chief of public information. He succeeds Harold J. Roche, who resigned. For the past five years, Green has been engaged in public-relations work for the Wisconsin Electric Cooperative.

### Engineers, Inc., veep

Engineers, Inc., engineering and consulting firm of Newark, N. J., has appointed Anthony Mauriello vice president of engineering administration.

Mauriello will supervise all design work performed by the firm. He was previously engineering administrator.



**August 11** — Highway 31 near Mackinaw City, Michigan, Denton Construction Co. laid 7250 lineal feet of 24 ft. pavement 9 inches thick, in 12 hours, with a 4 bin BUTLER TX-4 Roadbuilders Plant. Each bin equipped with 4 batchers to feed 4 pavers.



**August 25** — Same highway — same BUTLER TX-4 plant; same number of pavers: Denton laid 8036 lineal feet! Both these paving performances broke Denton's own 1958 record of 6029 feet of 24 ft. pavement, 9 inches thick. The August 25 demonstration of batching genius stands unapproached.

Does anyone want to try? Then get yourself a BUTLER TX-4. That, of course, is the primary and essential requisite.

### HERE ARE INTERESTING HIGHLIGHTS

In the August 25 record each batch contained 728 lbs. of cement, 1856 lbs. sand, 1532 lbs. fine stone and 1512 lbs. of coarse. In 12 hours Denton used 7,548 bbls. of cement — equivalent to 19 railroad cars. And the BUTLER TX-4 plant handled 3898 separate batches on that historical day!

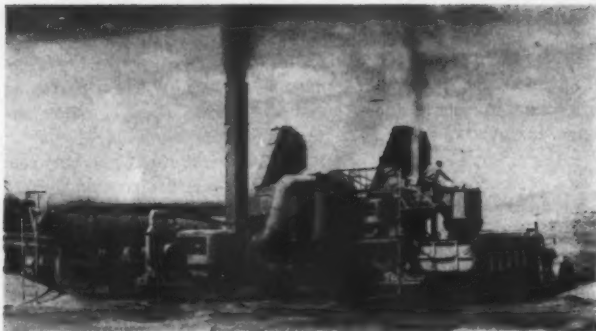
### BUTLER BIN COMPANY

971 Blackstone Avenue  
Waukesha, Wisconsin



Send for new, detailed, profusely illustrated Bulletin on the BUTLER TX-4 Road Builders Plant. Just a postcard will do — but write today.

For more facts, use Request Card at page 18 and circle No. 301



Bituminous-concrete paving has turned a narrow road leading to a Montana recreation area into a new highway. This Barber-Greene plant supplied the material for a 7-mile section. A GMC truck is loading at the Model 835 continuous mixer.

(Additional photo on front cover)

Continuous-mix plant  
on 7-mile project supplies

## Hot-mix for a mountain road

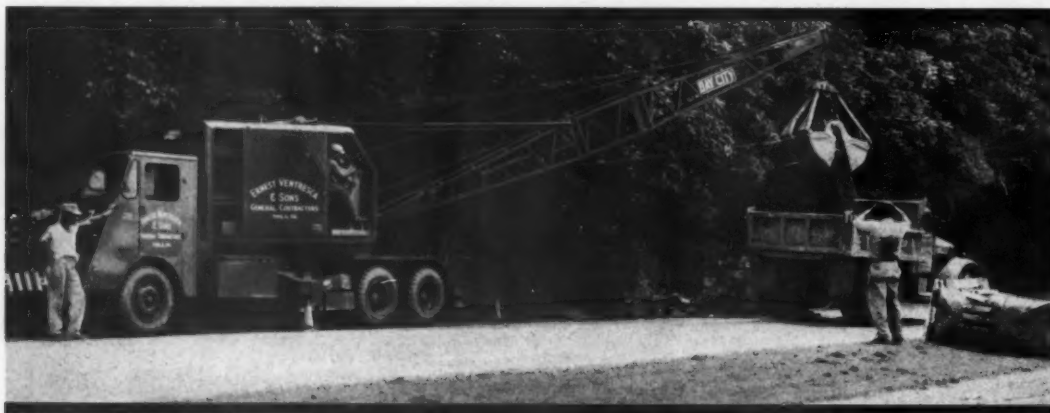


A Barber-Greene finisher is handling the job of putting down the 0.2-foot lift of surfacing. A GMC haul truck is filling the hopper of the rig.

# 22 DAYS AHEAD OF SCHEDULE!

## CRANEMOBILE®

COMPLETES JOB IN 45% OF  
WORKING DAYS ALLOWED



When Ernest Ventresca & Sons, Inc., Philadelphia, was awarded a contract for improving an existing storm drainage system in that city, the company was given 40 working days to complete the job. It included the installation of short pipe runs at regular intervals—2,000 feet of 15 and 18 inch concrete pipe were laid all told—in open ditch and tunnels along a four-mile stretch of East River Drive, the city's main traffic route along the Schuylkill River.

Ventresca & Sons used a **BAY CITY** 25-ton CraneMobile to dig ditch, set pipe, and handle backfilling. Despite poor weather and traffic congestion (the drive remained "open" 90% of the time), the entire project was completed almost a month ahead of schedule. Mr. Ventresca has this to say about **BAY CITY**: "Performance is a must in my work—I get it with a **BAY CITY**. That's why I'll go **BAY CITY** again."

CraneMobile features are "performance-proved" not only on "bread and butter" earthmoving jobs like this but on high, heavy lifts and long boom work as well. Accurate setting of high steel or precise

spotting of concrete beams is constantly assured by CraneMobile controlled lowering under power. Precise control at all boom angles is provided by the CraneMobile power-controlled independent boom hoist. The boom alone, or boom and load, can be raised or lowered simultaneously with any other operation. The hi-collapsible gantry, pin-connected boom and jib, demountable counterweight, and removable outrigger assembly permit rapid strip-down for between-job moves.

CraneMobiles are available in 25-, 30-, 35-, and 40-ton sizes, mounted on specially designed **BAY CITY**-built 6 x 4 or 8 x 4 carriers. For details and the name of your nearest dealer, write today.

# BAY CITY

SHOVELS, INC.  
2611-A Center Ave.  
BAY CITY, MICHIGAN

a subsidiary of Unit Crane & Shovel Corp.

For more facts, use Request Card at page 18 and circle No. 302

### Contractors and Engineers staff article

In a series of grading and paving contracts, the Montana highway department is transforming the Flesher Pass road, which runs northwest from Helena to State Route 20, from a narrow, winding, dusty road to a modern paved highway. The scenic route, which reaches elevation 6350 as it crosses the Continental Divide, leads to a huge wilderness recreation area known for its fishing and hunting.

The latest segment of the road to be completed is a 7.3-mile portion from Canyon Creek to Wilborn. This was done last year under a \$300,000 contract by a joint venture of Dilleworth Construction Co. and Maronick Construction Co., both of Helena. The paving was sublet to Sweeney & Lustgraaf of Great Falls.

The 200,000 cubic yards of unclassified excavation, which included some hard rock, was handled by a pair of Cat DW21 scrapers, a pair of International TD-24's with Cat 80 scrapers, and two International TD-34 tractor-dozers, one of which was equipped with an Ateco ripper. A Cat 12 motor grader did the finishing. One serious slide occurred after the grading rigs had pulled out. The material was pushed down and the slope refinished by an Allis-Chalmers HD-21 tractor. The excess material was loaded by an Allis-Chalmers HD-19 Tracto-Shovel into trucks and wasted.

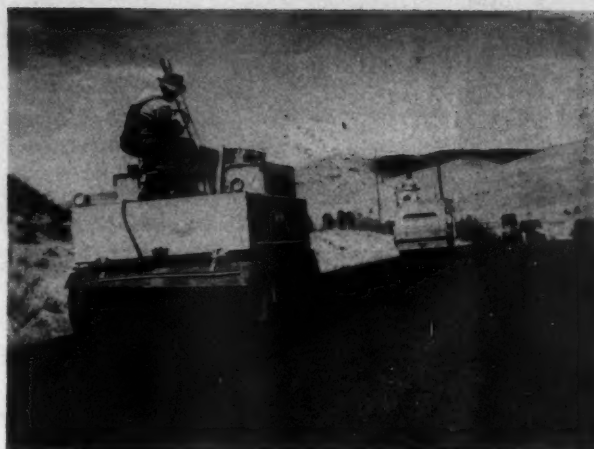


Asphalt hauled from a refinery at Great Falls is unloaded at the plant by a Kenworth truck tanker. Between the tanker and the Childers D50 hot-oil heater is the Cat D311 generator that supplies power for plant needs.

CONTRACTORS AND ENGINEERS



A Gallion 10-ton tandem makes the breakdown pass as the hot-mix is laid out. Paving is done in three strips by the paver to cover the 28-foot width of the roadway.



A Rosco 9-wheel rubber-tire roller handles intermediate compaction. The Gallion also handled finish rolling. Paving of the road was done under a sub-contract by Sweeney & Lusgraaf of Great Falls, Mont.

#### Gravel base course

While the grading crews were at work, a crushing plant in a gravel pit just off the right-of-way produced the base and surfacing aggregates. This was a 2-stage all-electric plant powered by two GM diesel-powered generators.

The contractor hauled minus 2-inch base material from the pit in trucks and spread it in two lifts to produce a compacted course 0.55 feet thick. A Cat 12 motor grader spread the material, mixed in the water that was applied by a 3,500-gallon tank wagon, and laid out each of the lifts. A Bros self-propelled 9-wheel rubber-tire roller compacted the material.

On this course, the contractor placed a 2-inch lift of minus ¾-inch crushed gravel, which was finished accurately to grade by the same general procedure. The finished base was primed with an application of 0.34 gallon per square yard of MC-1 cut-back asphalt by a Rosco 1,500-gallon distributor.

#### Bituminous paving

The single-aggregate mix for the 0.2-foot lift of bituminous surfacing was mixed in a Barber-Greene plant equipped with a Model 835 continuous pugmill mixer. A D7 dozer pushed the aggregate to a trap feeding a belt conveyor, which delivered the material to the plant dryer.

The 150 to 200-penetration asphalt for the mix was delivered in truck transports from the Phillips Petroleum Co. refinery in Great Falls to the plant's 10,000-gallon storage tank. This tank, as well as the pump, lines and pugmill, were heated with hot oil from a Childers D50 hot-oil heater. The mix contained 5.5 per cent asphalt treated with half a per cent No-strip additive.

The plant's dust collector and mixing unit were each powered with International engines. A Caterpillar D811 diesel generator set produced the electrical power necessary for incidentals.

A fleet of GMC trucks hauled the mix from the plant to a Barber-Greene finisher on the road. The paver laid the 2¼-inch course in a single lift, making three passes to cover the 28-foot roadway width.

A Gallion 10-ton tandem roller made the breakdown pass and also did the finish rolling. The inter-

(Continued on next page, col. 1)

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BUFFALO-SPRINGFIELD CO

SPRINGFIELD OHIO

PICKED YOUR 3 AXLE VIBRATORY ROLLER FOR VERMONT INTERSTATE

89 CONTRACT AFTER SEEING IT IN ACTION ON ANOTHER JOB. WAS

FASTEST METHOD I HAD EVER SEEN FOR COMPACTING BASE COURSE.

AFTER USING IT NOW KNOW IT'S FINEST VIBRATORY ROLLER ON MARKET

CHARLES L ROSSI, S V ROSSI CONSTRUCTION CO INC

TORRINGTON CONN

119P.

## "Finest Vibratory Roller on the Market"

says Charlie Rossi, S. V. Rossi Construction Co., Inc., Torrington, Conn.

Buffalo-Springfield KX-25EV 3-axle Vibratory Roller features exclusive "walking beam" compaction control. Center roll vibration from 1500 to 2200 vpm. Center roll can be raised hydraulically and machine used as two-axle tandem. Or you can use it as standard 3-axle tandem without vibration. See your Buffalo-Springfield distributor.



**BUFFALO-  
SPRINGFIELD  
COMPANY**  
Springfield, Ohio

**K** A Division of  
**KOEHRING**  
Company

For more facts, use Request Card at page 18 and circle No. 303

W102

71



This portable batching setup is handling concrete work on 12 launching areas at Schilling Missile Atlas Rocket Site near Salina, Kans. The Ross Porta-Plant is being charged by a Hough Model H70 Payloader. Challenge 7½-yard mixers on International trucks transport the concrete.

### Portable batch plants used on Atlas site

■ Careful planning and equipment integration have resulted in a successful portable concrete batching operation on the Schilling Atlas Rocket Site near Salina, Kans.

The Walt Keeler Co., of Wichita, Kans., concrete contractor for the project, is at present placing concrete on all 12 launching sites. A Hough Model H70 Payloader charges a Ross 30-3 batching plant, which is teamed with a Ross 350-B portable cement silo. The mixer, a Challenge 7½-yard rig, is mounted on an International RF 192.

Three Lorain motor cranes and one American motor crane are used to place the concrete at each missile site. The cranes are teamed up to handle the reinforcing steel, concrete buckets, and large formed sections.

### S. W. Brown appoints

■ Alex Bernstein has been named chief mechanical engineer for S. W. Brown, consulting engineering firm of New York City. He was formerly project engineer for Voorhees, Walker, Smith, Smith & Haines.

(Continued from preceding page)

diate rolling was done by a Rosco 9-wheel self-propelled rubber-tire roller.

The finished roadway will be sealed with an application of 0.25 gallon per square yard of cationic emulsified asphalt with cover chips applied at a rate of 25 pounds per square yard. The chips will be spread by a Flaherty spreader and rolled with both the rubber-tire and steel rollers.

### Personnel

The several phases of the work were divided among separate crews, each with its own supervision. Frank Klinge served as superintendent on the grading; Phil Maronick supervised the crushing operations and the placing of the base materials; and Bernard Sweeney handled the paving.

The Great Falls District of the Montana State Highway Commission was represented by project engineer Dean Poole and instrument man Stan Sedgwick. The district engineer is Ben B. Briscoe. The construction engineer for the Montana department is Lehman B. Fox, and the state highway engineer is Fred Quinnell, Jr.

THE END

### Final plans for '63 CIMA exposition, road show

■ The board of directors of the Construction Industry Manufacturers Association, Chicago, Ill., has completed final arrangements for its 1963 Construction Equipment Exposition and Road Show.

The exhibit, managed and produced by CIMA, will for the first time be sponsored by all of the national groups associated with the construction industry. The groups include: The American Road Builders' Association, The Associated General Contractors of America, The International Road Federation, and The

Associated Equipment Distributors.

Scheduled to be held concurrently with the equipment exhibit are the annual meeting of CIMA members, the general meetings and technical sessions of the ARBA, seminars of the IRF, and the convention of the NBCA. The 1963 AED convention sessions will be concluded on the morning of the exhibit opening.

Opening ceremonies for the exposition are to be held at noon on Saturday, February 23, 1963. The show will be open on Sunday, February 24, from 1:00 to 6:00 p.m.; and from 9:00

## All-wheel drive and



## the TS-14 "Euc" is in a class by itself!

No matter what your scraper requirements may be — small yardage work for land conservation, secondary roads etc. to the biggest projects — the Euclid TS-14 can cut your earthmoving costs.

Here's performance and overall work-ability in a medium size scraper — 14 yds. struck and 20 yds. heaped — that's way ahead of any scraper of comparable capacity. With two engines (296 total h.p.) and separate Torqmatic Drives for each axle, the TS-14 gets a heaped load in a hurry... gets out of the borrow pit or cut fast... and highballs on the haul road. It can self-load in practically any

material, and with a pusher it's a big producer on the toughest jobs.

If you want a one-man earthmoving spread that can work more days per year... that handles a wider range of jobs and isn't stalled by steep grades and adverse conditions... ask your dealer for the new catalog No. 555 or better yet, have him show you one in operation.

**EUCLID Division of General Motors**  
Cleveland 17, Ohio

Plants at Cleveland and Hudson, Ohio  
and Lanarkshire, Scotland

a.m. to 6:00 p.m. Monday through Friday, March 1.

All phases of the exhibit will be supervised by the CIMA board of directors, working through the Exhibit Committee that includes the following members: Boyd S. Oberlink, chairman, Allis-Chalmers Mfg. Co.; A. J. Lichtinger, vice chairman, Wellman Engineering Co.; Donald V. Buttenheim, Buttenheim Publishing Corp.; W. K. Cox, Caterpillar Tractor Co.; Warren A. Holden, Construction Machinery Co.; Robert E. Hunter, Detroit Diesel Engine Division, GMC; Kenneth Lindsay, Iowa Mfg. Co.; J. E. Mitchell, The Firestone Tire &

Rubber Co.; Buel M. Wallis, Schield Bantam Co.

The following committees have been established: Rules and Regulations, Buel M. Wallis, chairman; Space Allocation, A. J. Lichtinger, chairman, and George C. Williams, co-chairman; Publicity and Public Relations, Donald V. Buttenheim, chairman, and Harvey A. Scribner, co-chairman; and Housing, J. A. Mitchell, chairman.

Exhibitors will be limited to U. S. manufacturers who have been dues-paying members of CIMA during 1961, 1962, and 1963, and to members of the M & S Division of ARBA.

## Two western conferences present latest advances in construction of prestressed-concrete buildings

■ Two western conferences on prestressed-concrete buildings, held during November in Los Angeles and San Francisco, noted the outstanding advancement in the application of prestressed concrete to building construction during the 3-year period since the World Conference on Prestressed Concrete in San Francisco in 1957.

Nearly 500 architects, engineers, manufacturers, and other interested persons attended the twin 2-day meetings. Although the conferences



Panel member Robert J. Lyman, left, chief engineer, Atlas Structural Concrete, Inc., El Paso, Texas, and speaker Al Yee, president of Alfred A. Yee Associates, structural engineers, Honolulu.

were somewhat regional in attendance, the speakers and panel participants were drawn from as far away as New York, Mexico City, and Honolulu.

The speakers described and illustrated the problems in the application of prestressed concrete to the design and construction of many types of buildings under a wide variety of conditions.

The consensus of opinions expressed by the speakers indicated that architects and engineers are coming to realize that they must work very closely together and in full cooperation with the manufacturers in this relatively new field. In so doing, they are providing prestressed-concrete members for a wide variety of building applications at prices that are competitive with other building materials.

The structures discussed included parking garages, churches, grandstands, and a number of tall buildings, housing offices and apartments. Among the latter were structures in the 20-story category.

Sponsors of the conferences were the University of California and the Prestressed Concrete Manufacturers Association of California. The committee was headed by Professor T. Y. Lin of the University of California.

## Bethlehem Steel head named Stevens trustee

Edmund F. Martin, president of Bethlehem Steel Corp., Bethlehem, Pa., has been appointed to the board of trustees of Stevens Institute of Technology, Hoboken, N. J.

Martin, a Stevens alumnus, has served Bethlehem Steel in various capacities since 1922. He became president last August.

Also appointed to the Stevens board of trustees were the following: Eugene McDermott, chairman of the executive committee of Texas Instruments, Inc.; Charles G. Mortimer, chairman of General Foods Corp.; and Gordon N. Thayer, vice president of operations of the American Telephone & Telegraph Co.

## Sprague & Henwood news

■ Sprague & Henwood, Inc., Scranton, Pa., recently opened a southwestern branch in Tucson, Ariz.

Bill B. Williams is manager of the new branch. He was previously superintendent in the western regional office in Gerard Junction, Colo.

# and greater versatility...



- Twin-Power ... a Euclid exclusive
- Hydraulic scraper operation
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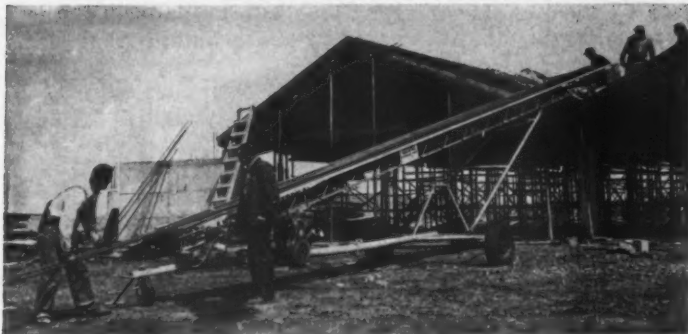
*All-wheel drive "Twins" give you a longer, more profitable work season*



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## Places Concrete and Reinforcing Steel with Morgen Hydraulic Drive Conveyor

Labor and equipment costs can get out of hand on such types of construction as the classroom wing of the Coronado Junior High in Kansas City, Kansas, with its folded plate roof and widely spaced reinforced concrete supporting columns.

O. C. "Bud" Everhart solved the equipment problem with a Morgen Hydraulic Drive Belt Conveyor. The conveyor combined vertical and horizontal movement to carry concrete from ready-mix trucks into the building and directly into the forms. All the columns and beams were poured by the belt conveyor at a fraction of the cost that would have been involved with the use of a crane or men with buckets and buckets.

Everhart saved additional expense by putting the Morgen conveyor to work feeding roof reinforcing rod from the ground to the roof level. Laborers working on the ground broke bundles and loaded rod on the conveyor. Just a few feet of rod resting on the belt gave enough traction to drag the rest of the rod onto the conveyor. The 40-foot conveyor easily handled #6, 7 and



9 reinforcing steel. Length varied, but some bars were 100 feet long.

The conveyor did most of the work of getting steel into position. The tie-in man simply led the rod off into the desired location as the conveyor continued to push the bar up and into position.

## MORGEN SELF-TRAINING IDLER ROLLER CONVEYOR

Here's the biggest development in concrete handling in years! Designed for maximum high-speed, adjustment-free movement of concrete or free-flowing material and narrow solid materials, the Morgen Self-Training Idler Roller Conveyor is the most versatile low-cost material-handling equipment available today.

The self-training rollers automatically keep the belt running straight regardless of loading and without leveling the conveyor undercarriage. These idlers never require adjustment. There's nothing else like it on the market! Fully portable in 32, 40, and 48' lengths.



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## Big cylinder piles for freeway bridge

Contractors and Engineers staff article

Big prestressed-concrete cylinder piles, driven to 260 tons bearing and left projecting out of the ground to serve as pier columns, provide the foundations for three new structures making up the Ravenna Boulevard overcrossing of the Seattle Freeway. The 48-inch piles, which have 5-inch walls, are thought to be the largest ever used on a bridge in the western states.

The 266 piles, ranging in length from 19 to 65 feet, were cast and post-tensioned in the casting yard of the Concrete Technology Corp., Tacoma. They were trucked some 35 miles to the job site, set into prebored holes, and driven to the required bearing by a heavy air-powered pile hammer.

The prestressed-concrete girders for the deck systems rest on caps that were cast in place over the tops of the cylinder piles. A 5½-inch slab was cast in place to complete the deck.

MacRae Bros. Construction Co., Seattle, held the \$2.3 million contract with the Washington Department of Highways for the construction of the three structures, which are located at Ravenna Boulevard and East 65th Street, just a few blocks north of the north approach to the new freeway bridge over Lake Union.

Each of the three parallel structures is 1,350 feet long and carries the freeway over Ravenna Boulevard, 65th Street, and Weedon Place. One of the outer two carries four lanes of the northbound traffic; the other has four lanes for southbound traffic. The central structure carries three lanes, which are reversible to handle

southbound traffic in the morning and northbound in the afternoon.

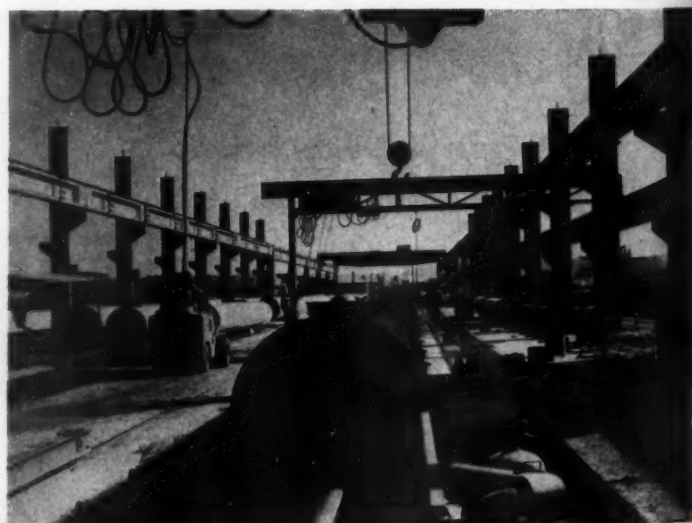
The bed on which the Concrete Technology Corp. cast the piles is 250 feet long and 20 feet wide. Rows



A Towmotor truck is used to deliver concrete to the forms in a special 15-foot bucket, designed and built by Concrete Technology. The bottom-gated bucket has vibrators attached to aid in handling the stiff mix used.

of columns along each side support elevated crane rails carrying a pair of Ederer overhead bridge cranes for handling the heavy form sections and the finished piles. Two smaller Wright Speedway cranes span half of the bed, with one leg riding on a lower crane rail mounted on corbels on the sides of the columns. The other leg of the crane travels on a rail laid down the center of the casting bed.

The steel forms for the cylinder piles were built locally to CTC's specifications. The inner form consisted of a collapsible steel cylinder with spacers to hold it the fixed distance from the outer form. The outer form consisted of three elements. The lower half circle rested on the casting bed.



Casting of the 48-inch prestressed piles for three adjacent freeway bridges in Seattle is done on this 250-foot bed at the Tacoma yard of Concrete Technology Corp. Forms were built to specifications. The inner form is collapsible; the outer form is in three sections—a semicircular bottom piece and two top quadrant sections. Rubber tubes are encased in the pipe being cast and pulled out later to leave holes for the prestressing cables. Two overhead bridge cranes, and two Wright Speedway cranes that span half the bed, serve the operations.



Actual placement of concrete in the forms is handled by the Wright Speedway crane, which has one leg mounted on a crane rail, the other on a rail on the casting bed. It dumps concrete through the small opening at the top of the forms as it moves down the bed.



Plenty of vibration is needed by the dry and rich concrete, and this is provided by vibrators specially designed and built for this work. These vibrators, attached to the exterior of the steel form and driven by motors, ordinarily run continuously during placement.



A special finishing tool is used to finish off the exposed concrete in the narrow gap at the top of the form. The tool rides on the form itself and has the shape of a finished pile to provide the desired finish.

Two upper quadrants locked in place after the inside form had been placed. A space about a foot wide remained open between the upper quadrants to admit the concrete.

Rubber tubes were stretched through the forms in the locations of the prestressing cables. After the concrete was cast, these tubes were removed, leaving spaces through which the cables could be threaded.

The very dry, rich mix used to cast the piles was produced on the site in a plant designed and built especially for CTC. A Cumflo mixer on the lower platform of the tower produced the mix and dumped it into special 15-cubic-foot buckets that were transported around the site by a Towmotor fork truck.

The fork truck delivered the buckets to one of the Wright cranes that straddled the forms. This crane carried the bucket along over the opening in the forms as the concrete was dumped. Because of the zero-slump mix, vibration was extremely important. Specially built vibrators driven by electric motors were permanently attached to the lower quadrant of the forms and were operated continuously during the concrete placement operation.

The buckets, too, were fitted with these external electric vibrators to help dump the concrete. The vibrators plugged in as the crane picked up the bucket.

As the form was filled, a workman using a special strike-off trowel

(Continued on next page)



At the bridge site, the cylinders are set into predrilled holes. This Highway 56-inch drill sinks holes 6 to 13 feet deep for the piles. Another and bigger drill dug 54-inch holes to 35 feet in depth for some of the piles.



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## Scrapper performance is important through EVERY INCH OF THE WORK CYCLE

Allis-Chalmers' new TS-360 Motor Scraper—30 yards heaped—was designed with four major performance factors in mind: acceleration under load, sustained haul speeds, exceptional maneuverability and full-power spreading on the fill.

To achieve this performance, the 340 hp scraper is equipped with a Fuller 5-G-1520 5-speed Transmis-

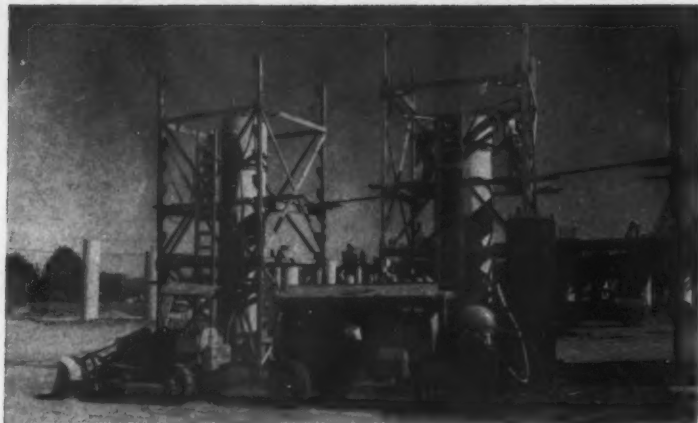
sion. The heavy-duty, constant-mesh, spur-gear transmission features the Fuller Air-Actuated Countershaft Inertia Brake, which permits quick, easy up-shifts without double-clutching. Activated simply by pushing a button, the countershaft brake helps maintain momentum during shifts for maximum acceleration and sustained speed throughout the entire work cycle.

The 5-G-1520 is also equipped with the Fuller Pressure Lubrication and Filtration System which keeps gear oil clean, provides longer gear and bearing life and higher equipment availability.

Ask your equipment dealer about the Fuller Transmission designed to get more work from *your* equipment, put more profit in *your* operation.

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Piles are cut off to grade. After a saw cuts  $\frac{1}{2}$  inch deep around the column, holes are drilled through the pile on each side of the tendons, the tendons are cut off and concrete is chipped away. Here, a Jaeger compressor supplies air for the drilling and chipping hammers. An Oliver tractor tows the compressor.



After being set in the predrilled holes, the piles are driven to specified bearing by a big Vulcan 0-14 single-acting hammer with a special driving helmet. It is powered by two 600-cfm compressors pumping into a receiving tank. The single-acting hammer has a ram weight of 14,000 pounds and a stroke of 3 feet.

(Continued from preceding page)

finished the exposed portion at the top of the cylinder.

This  $7\frac{1}{2}$ -sack dry concrete needed no special curing to attain adequate strength. In fact, tests showed that it attained a strength of 8,000 to 9,000 psi in 7 days and 10,000 psi at 28 days.

After the metal forms were removed and the rubber tubes pulled out, four commercially produced 7/16-inch prestressing strands were threaded into each of the ten holes. These tendons were stressed to 76 kips each and locked in place at the outer ends of the row of piles by the Anderson system, which uses a cast-steel socket and a conical aluminum plug. Grout was then forced through the space around the strands to fill the voids and bond the strands to the concrete.

#### Piles set in drilled holes

The completed piles were trucked to the bridge site and set into predrilled holes. The first group of holes was drilled 6 to 13 feet deep by a Highway 56-inch drill mounted on the rear of a truck. The remainder of the holes were drilled by a larger Calweld drill that sank 54-inch holes up to 35 feet deep. In general, the drilling was required in order to get down through the upper soil strata to the sand layer on which the piles were to bear. However, in one area, it was necessary to get down below a deep sewer before starting the driving in order to protect the sewer from possible damage.

Using a special lifting collar and a double sling, a Lorain motor crane picked the piles from the trucks and set them in the holes ready for driving.

#### Use heavy hammer

A 35-ton Lorain motor crane then set the Vulcan 0-14 hammer with its special driving helmet on the pile and began driving. This hammer is single acting with a ram weight of 14,000 pounds and a stroke of 3 feet. It delivers 42,000 foot-pounds of energy per blow. It was operated by two Jaeger 600-cfm compressors connected to a common receiver tank. The assembly of the hammer and



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*give you greater load capacity, more savings in*

**Lightweight, simplified power divider** — Through-drive hypoid design transmits equal driving force from triple helical gears to forward axle and then through drive shaft to rear axle. Both drive pinions rotate in a 1-to-1 ratio.

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**Clean-cut appearance** — Differential carriers are centered, all drive parts are kept within diameter of housing banjo. Brake diaphragms are in protected areas. Shafts and other parts interchangeable between axles.

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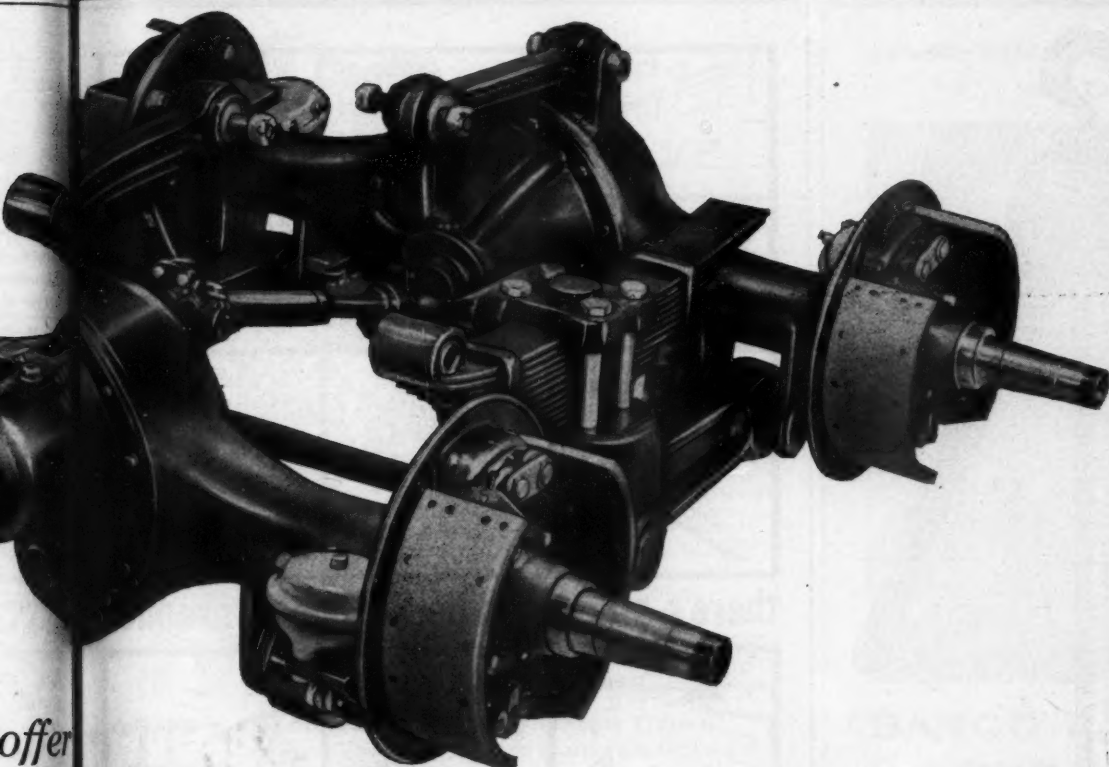
**IH Built, IH Serviced, IH Warranted** — Built by the makers of the most complete line of trucks—sales leader in six-wheel trucks for 25 straight years. Service availability nationwide. Performance warranted for 100,000 miles.



Concrete placement for pier caps is handled by a Lorain motor crane using a Morin 1-yard bucket that is being filled from the Rex transit mixer on the International.



The bucket has a circular hole in the bottom stopped by a conical steel plug that is attached to a second line from the crane. The plug is raised to dump the bucket. The operation works well and requires one less man than does work with a conventional bucket.



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Compact design for a variety of loads.



Mighty "6's" take transit-mix loads anywhere.



Delivers huge dump trailer loads with ease.

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driving helmet weighed 18 tons.

The piles were driven from as little as 1½ feet to as much as 18 feet through the glacial till and sand to develop the required bearing value of 260 tons using the Engineering News formula.

The piles were left projecting out of the ground to form the pier columns. Since the piles could not be driven to precise depths, the tops had to be cut off after the driving.

A steel collar was clamped around the piles at the cutoff elevation, and a half-inch-deep cut was made all the way around with a diamond-edged saw. Holes were then drilled through on both sides of the tendons so that the steel could be cut. The remainder of the concrete above the rings was then chipped away with air hammers.

A wood form was hung inside the piles 4.2 feet down from the cutoff line, and a concrete plug was cast in this top portion of the piles. Steel dowels were embedded in this plug and left projecting up into the cap.

Forms for the pier caps were supported on 6 x 16 timbers supported at each pile by double steel channels hung from the piles. The ¾-inch plywood soffit form was supported by 4 x 4 joists laid across the 6 x 16's. The cap sides were formed with plywood forms backed by 2 x 4's and tied through with she-bolts. The semi-circular steel end forms were constructed to tie in to the plywood sides.

Transit-mix concrete was supplied by the Pioneer Sand & Gravel Co., Seattle, and was placed by one of the Lorain motor cranes using a Morin 1-yard self-dumping bucket. This bucket has a conical plug gate that fits the circular hole in the bottom of the bucket. The gate is raised by a second line from the crane to dump the bucket. Its weight and the weight of the concrete on it keep the gate closed.

### Prestressed-concrete girders

The prestressed-concrete deck girders were supplied from the new plant of the Associated Sand & Gravel Co., Everett, Wash. Because of a number of skew situations, the girders range in length from 7 to 109 feet. They are I sections with 5-inch webs and

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Concrete for the casting operation is supplied by this plant, designed and built by CTC, and fitted with a Cum-flo mixer.

(Continued from preceding page)

depths ranging from 2 feet to 4 feet 10 inches. Flange widths are 14 inches for all girders up to 70 feet long and a maximum of 24 feet for the longest. They have both straight and harped pretensioned strands.

The girders were delivered by truck and set in place by the Lorain motor cranes on grout pads surmounted with 1-inch neoprene cushions.

MacRae suspended forms from special wire form hangers cast into the top flange of the prestressed girders from the 5½-inch concrete deck slab. The deck concrete was placed with Gar-Bro 1-cubic-yard buckets handled by one or more Lorain cranes and finished with Clary power screeds.

This project got under way in January, 1960. The first girders were set late in July, and the first concrete for the deck was placed in September. Deck placement continued on into the fall and winter as weather permitted. The structure is scheduled for completion by this July.

#### Construction follows estimate

After doing a very careful job of estimating and bidding this project, MacRae Bros. is following through to see that each step of the construction parallels the estimate both in method and cost. The firm is not waiting until the end of the job to see whether it has made a profit but is carefully checking the costs of each item as done.

Ralph Finke, MacRae's chief en-

gineer, is the final authority in estimating the jobs, as well as in constructing them. He believes in carefully and thoroughly planning the construction when making the estimate, rather than taking comparative costs from other jobs. Even the special equipment needed, such as the special helmet for the pile driver, was carefully planned and estimated. These plans all went down in writing so that they were available when construction got under way.

In this case, the careful bidding certainly paid off since MacRae left only \$716 on the table on this \$2.33 million job.

#### Personnel

The supervisory staff for MacRae Bros. Construction Co., in addition to

## Again Coffing Brings You a New Line of Hoists

For the second time in less than a year Coffing has introduced a new hoist line to give you easy, safe, positive efficient lifting power at moderate cost.

The new RA Series Safety Pull Aluminum Ratchet and Pawl Lever Hoist is easy to operate—requires minimum handle pull—only 59 pounds for the ¾-ton model to 97 pounds for the 6-ton model. It may be operated from either side and the design prevents freezing a load. Load rotation is easy because of ball thrust bearings in the load hook assembly.

Safety has been built into the hoist. It will not ratchet under load if handle is released nor will it free chain. Controls are protected from inadvertent shifting. The bottom stop eliminates any hazard from the handle being released unintentionally and prevents handle from being moved to a position parallel to the load chain which would develop undesirable twisting action. The exclusive safety handle bends to indicated overload.

Strength without excess weight in the new hoist is achieved by a special aluminum alloy which is used in the body and handle. Long service life has been provided by the high tensile material in the chain retaining guide, heat treated load sheave and the plated, high tensile, heat treated alloy steel link chain. Maintenance is held to a minimum by the rugged construction and simplicity of design.

The new Coffing RA Series Safety Pull Aluminum Ratchet and Pawl Lever Hoist is available in six models with capacities from ¾ to 6 tons. Ask your distributor or write for Bulletin ADH-86S.



## COFFING HOISTS

DUFF-NORTON COMPANY

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#### COFFING HOISTS

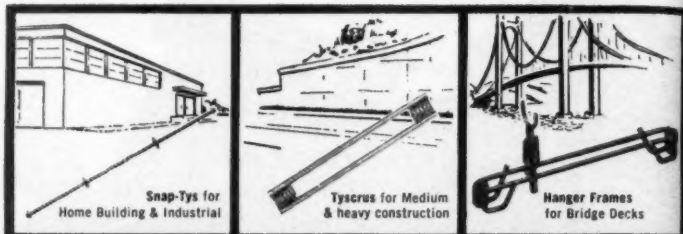
Ratchet Lever • Air  
Hand Chain • Electric



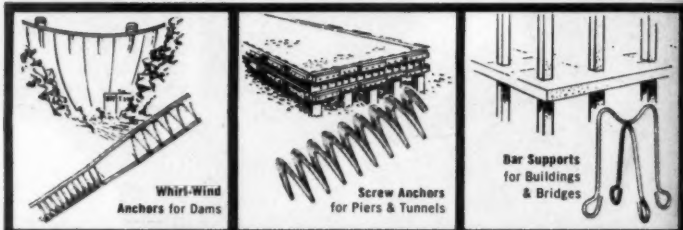
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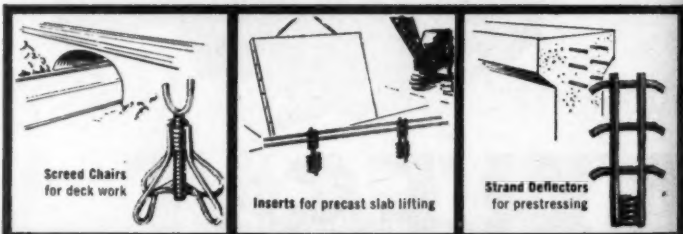
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For every kind of concrete construction



there's a dependable Richmond product!



Richmond has learned, through years of practical experience and research, how to design and produce the most effective and economical form ties, anchors, inserts and accessories for every conceivable kind of concrete construction.

All Richmond-engineered products, and there are more than 400 in the complete line, are designed to provide the extra strength that assures a safe, dependable forming job while saving time and money.

In addition, Richmond's field representatives and Technical Department can help you with any problem you might encounter in planning your form work... and will provide you with estimates, "take-offs" and material specifications on request.

Richmond's line of laboratory-tested form ties, anchors, inserts and accessories is the largest—in the field. It provides you with one source for all your concrete forming needs... ask for, and insist on "Richmond".

For complete information about Richmond's full line of quality products for concrete construction—or assistance with any specific concreting problem, write to:—



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CONTRACTORS AND ENGINEERS

Finke, included superintendent Robert S. Currie, field engineer Sid Porter, carpenter foreman Ray Hall, and pile-driving foreman Orval Gassage.

The Washington Department of Highways was represented on the project by resident engineer Pierre Hendricksen and assistant engineers Al Stacker and Bruce Sheldrew. The bridge engineer for the Washington department is George Stevens. The director of highways is W. A. Bugge.

THE END

## Oliver changes trademark

■ Oliver Corp., Chicago, Ill., which recently became a wholly owned subsidiary of The White Motor Co., is changing its traditional trademark, a

red and green shield, to a keystone around a sturdier shield, in orange, black, and white, and with a new block-letter "Oliver."

The new shield will be featured on all Oliver farm and construction-equipment products, as well as by all Oliver branches, plants, and distributorships.

## New sales department formed by Maginniss

■ Maginniss Power Tool Co., Mansfield, Ohio, has formed a new sales department to develop closer relations with its distributors.

Roger A. Minnich, vice president, has been named sales manager. He will handle the selection, training, and supervision of all factory sales

personnel, and will direct distributor sales and service. He was previously in charge of product development.

Dale E. Anderson is the new assistant sales manager. He will be in charge of customer service, advertising, and sales promotion. He has served the company in such capacities as office management, purchasing, and advertising-agency contact.

Mary Burgess has been appointed sales supervisor. She will assist Minnich and Anderson.

## Spray Products names

■ New vice president and director of export for Spray Products Corp., Camden, N. J., is Richard H. Henry.

Henry was previously with the American Express Co.

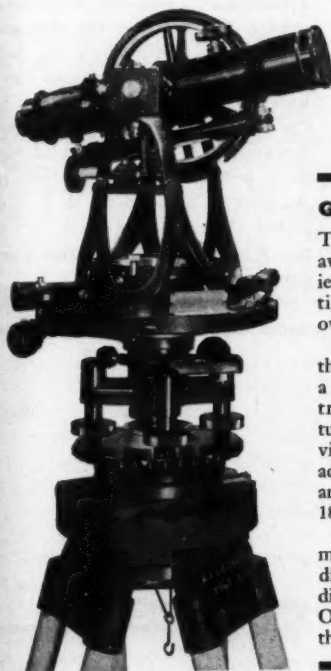
## Heil acquires new line

■ The Heil Co., Milwaukee, Wis., has acquired the material-handling equipment business of the Ingersoll Kalamazoo Division of Borg-Warner Corp.

Production machinery for the equipment will be moved from Kalamazoo, Mich., to Heil's main plant in Milwaukee, and will be operated as a part of the Body and Hoist Division.

Ingersoll Kalamazoo's principal material-handling product is the Load-Lugger, which consists of large detachable steel containers or bodies that are picked up, hauled, and dumped by a truck equipped with a Load-Lugger hoist mechanism.

Heil products include dump-truck bodies, transportation and storage tanks.



## A Guide to OP and VP

### Gurley Optical Plummet

The Optical Plummet Transit opens new avenues in accuracy, speed and convenience...eliminates inconvenience and lost time involved in centering a plummet over a point.

The Optical Plummet is a telescope through the vertical center (spindle) of a transit. It will point vertically when the transit plate is level. The telescope is turned at right angles by a prism, so that vision is actually horizontal. Setting and adjustment may be checked very simply and precisely by rotating the instrument 180 degrees.

The Gurley Shifting Head Tripod permits 1 1/4" movement of the transit in two directions 90° separated, without material disturbance to the level of the plate (the Optical Plummet thus remains operative through the entire centering procedure).

### Advantages of the Gurley Optical Plummet Transit

- Saving in set-up time, as much as 33%—a factor when a crew is waiting.
- Eliminates swaying plumb bob.
- More accurate centering over point.
- On construction work—sights on points some distance below, such as encountered in bridge work and building construction.
- Made in U.S.A.—Little servicing, but easily repaired when necessary.

### Gurley Optical Plummet Transits Available in 21 Combinations

With Circular Compass	With Trough Compass	Without Compass
OP-52	—	OP-57
OP-62	—	OP-67
OP-132	OP TC 137	OP-137

And with limb reading to 1 min.; or 30 sec., or 20 sec....Stiff-leg or Extension-leg Tripods with Constant-Level Shifting Head and wide-frame European-type construction.

### Variable Power is standard on Gurley Transits and Levels:



- Wide range of magnification with one eyepiece—zooms for near or distant objects
- Easily adjusts to suit weather and light conditions
- Built-in haze filter

- At high power:
- longer shots
  - less glare in bright sunlight
  - increase in readability
  - no glare...high contrast
  - blacks and whites stand out

- At low power:
- greater field
  - brighter field
  - decrease of heat waves

We will be pleased to send you further information about both Gurley Optical Plummet Transits and Gurley Variable Power Eyepiece.

Both Optical Plummet and Variable Power are patented.

**W. & L. E. Gurley** • Fulton & Station Sts., Troy, N. Y.

For more facts, use Request Card at page 18 and circle No. 310

Where SPECIFICATIONS call for . . . .

**HIGH DEGREE SOIL COMPACTION**



## BARCO RAMMERS are THE ANSWER!

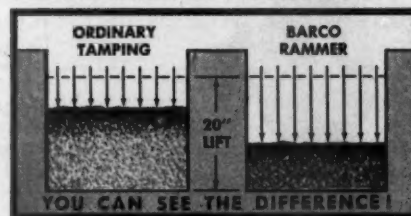
**YOU** can't get high degree SOIL COMPACTION by "patting it" or "shaking it." For deep, penetrating force to produce 95%, 97.5%, or even 100% compaction, Barco Rammers are THE ANSWER. For many soil conditions, they are the only answer.

High degree soil compaction is worth every cent it costs. Barco Rammers are especially effective for compacting fill in restricted areas—close to walls, culverts, abutments, around footings, and in trenches.

**ONE MAN OPERATION**—On area tamping, one man can average 20 to 30 cubic yards of fill per hour. On 18" trench backfill, using lifts up to 24", the rate is 360 to 600 feet per hour.

**ASK FOR A DEMONSTRATION**—We will be glad to arrange a demonstration for you; see our nearest distributor or write.

SEND FOR A COPY OF CATALOG 621.

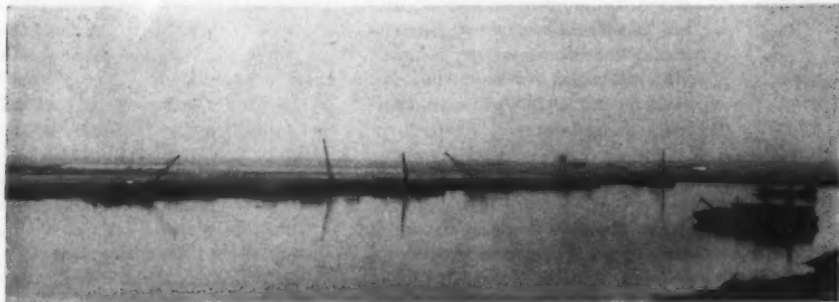


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**BARCO MANUFACTURING CO.**  
5188 Hough Street • Barrington, Illinois

**BARCO RAMMER** for High Degree Soil Compaction  
**BARCO-VIBRA TAMP** for Granular Fill and Bituminous Surfacing  
For more facts, use Request Card at page 18 and circle no. 311

Booms of barge-mounted cranes stand out above the tidal marsh along the Elizabeth Channel at Port Newark, N. J., as the rigs drive piles and place rock fill for the first of three new deep-water piers for the Port of New York Authority. Piers will extend almost 3,200 feet along that side of the channel and 1,700 feet on the near side.

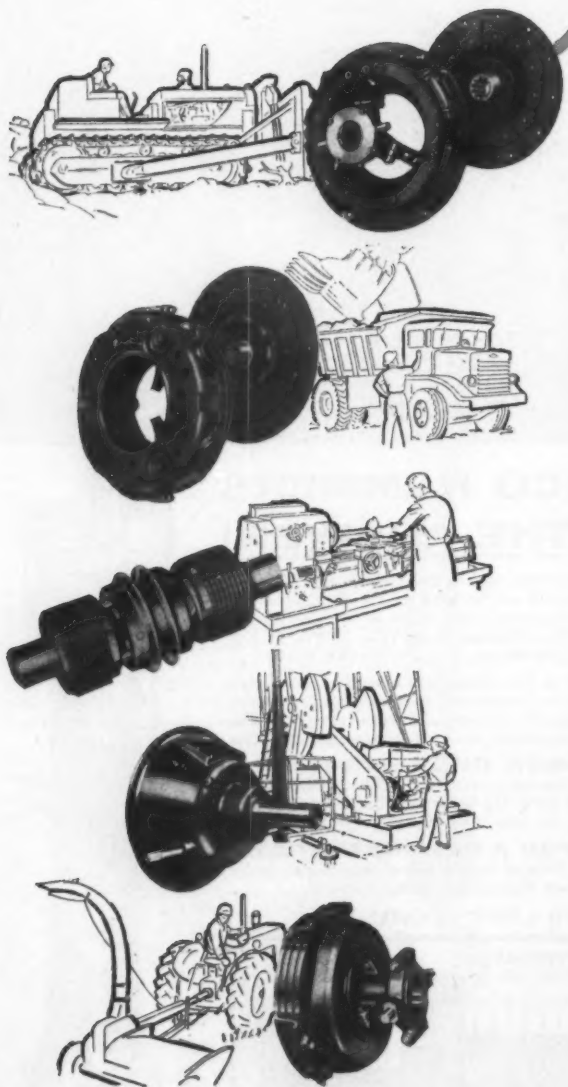


## Work from barges for pier on tidal marsh

Stone for fill is being floated to the site; barge-mounted crane will handle concrete placement

by CLARK H. BATCHELDER  
field editor

### DYNAMIC POWER CONTROL by ROCKFORD CLUTCH



#### EXTRA THICK FACINGS GIVE LONGER LIFE

Rockford Clutches have maximum thickness facings . . . up to 1/32" more friction material. Only the highest grade materials are used. Rockford's extra long-life facings reduce scoring and greatly cut costs of downtime, replacement and labor.

#### TORTURE PIT TESTING ASSURES SAFE OPERATION

Torture testing pits burst clutches to bits! At specified intervals, clutches are removed from the production line to undergo severe centrifugal tests. These clutches are spun to destruction but must withstand predetermined high speeds and specified time limits.

#### STRONG CONSTRUCTION WITHSTANDS RUGGED SERVICE

Corrosion resistant discs are made of high carbon spring steel. Heat treated cast iron improves grain structure of pressure plates. Strong construction is Rockford's key to long and rugged service.

#### VIBRATION-FREE CLUTCHES OFFER SMOOTHER ENGAGEMENTS

Smooth engaging Rockford Clutches are vibration-free! Rockford Clutch eliminates vibration through dynamic and static balancing. Clutch vibration can ruin bearings and crack housings. Minimum inertias prevent gear clashing and delayed shifting.

#### PRECISE PRODUCTION MEANS PRECISE PERFORMANCE

Each Rockford Clutch component is precision built. Rotary surface grinding assures uniform thickness. Discs are checked carefully for dish and run-out. Inspectors check close tolerances for flatness by pressure and weight-drop drag machines.

If you need clutches for original equipment or for replacement, Rockford Clutch offers the highest quality in power control. From research to inspection, Rockford Clutches are designed and built for long, rugged and reliable service. Rockford offers an ultra-wide range of power controls for all industries. Write today for illustrated brochure.

## ROCKFORD CLUTCH

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Export Sales Borg-Warner International • 36 So. Wabash, Chicago, Ill.



DIVISION  
OF  
BORG-  
WARNER

For more facts, use Request Card at page 18 and circle No. 312

Inaccessibility and lack of adequate storage facilities are the problems facing Horn Construction Co., Inc., contractors for the first three deep-water berths that are to be built on the new Elizabeth Channel at Port Newark, N. J., for the Port of New York Authority. Contracts held by the Merrick, Long Island, N. Y., firm exceed \$5 million and are a part of the Elizabeth-Port Authority Piers development program.

The channel, completed last fall under another contract, is 9,000 feet



The new piers will have reinforced-concrete decks 45 feet wide resting on cap beams supported on wood piles and stabilized with stone fill. This barge-mounted Manitowac 3500 crawler uses 100-foot leads and a McKiernan-Terry 10-B-3 hammer to drive 60 to 80-foot Greenheart piles. Air is supplied by a Chicago Pneumatic compressor located at the rear of the crane.

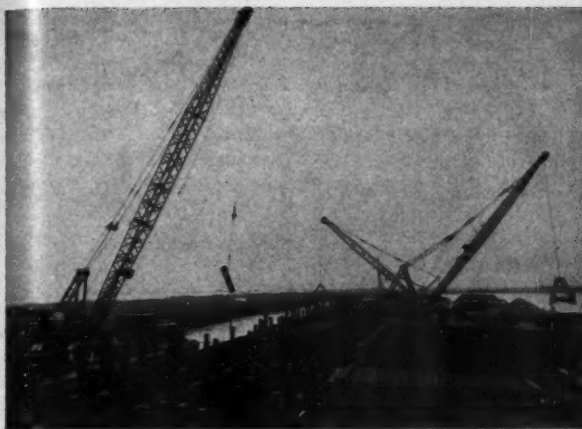
long, 600 to 800 feet wide, and 35 feet deep. The new piers will extend nearly 3,200 feet on the south side of the channel and 1,700 feet on the north side. Work started in August of 1960 and is scheduled for completion early this summer.

#### Piers form bulkhead

Running parallel with the shore, the piers will have decks of reinforced concrete 45 feet wide and 11½ inches thick. Decks will be on concrete cap beams supported on wood piles and stabilized with a stone-fill dike.

Cresoted timber sheeting is bolted vertically to the inshore side of the pier. The sheeting and the stone fill form a bulkhead that will retain the hydraulic fill pumped in to reclaim the marsh.

CONTRACTORS AND ENGINEERS



Pile tops are cut off with a chain saw, and a Lima lifts them to a storage barge. In the background, a Manitowoc 3900 and a P&H 1250 with Owen clamshell buckets unload and place the rock fill. The 10-pile bents are on 8-foot centers.



Rock fill is obtained 12 miles from the site. At the job, tonnage is checked on Howe scales. An Autocar is on the scales; an International waits its turn.



Rock dumped from an Autocar goes to the hopper of a Lippman Grizzly King 32 x 40 jaw. When there is a wait between deliveries, the material is kept moving from a stockpile to the crusher by a B-E 54-B shovel.

#### Builds storage area

Since the area inshore of the pier is tidal marsh and material-storage space was needed, Horn built a dock and rehandling point on the north side of the channel. Piles, framing timber, reinforcing steel, hardware, fuel, and other items are loaded on barges and moved out as needed. A barge-mounted Manitowoc 3900 crawler, six flush-deck barges, and two tugboats are used in this operation.

#### Pile-driving control

Field engineers and pile foremen keep precise control of pile locations by means of two base lines parallel with the center line of the piers. Because of the marshland, it was necessary to run one line on solid ground 500 feet upland from the pier. The second line is 130 feet inboard at the edge of the marsh.

A transit is set up on the 500-foot line, and the instrumentman shoots through the close-up line to the bent. A man rows in from the pile rig to the 130-foot base line carrying the zero end of a chain on which the pile distances are marked with brass tags. By holding the chain on the base line, and with the transitman keeping line, the pile foreman locates correct center line and offset.

Each bent has ten piles. Pile centers are 4 feet 7 inches across the pier. Bents are on 8-foot centers. Lengths of piles vary from 60 to 80 feet, and penetration is from 30 to 50 feet. The driving spread consists of two barge-mounted Manitowoc 3900 crawlers using McKiernan-Terry 10-B-3 air hammers. A Chicago Pneumatic 900 and two Ingersoll-Rand 600 compressors supply the air.

#### Rock fill crushed on job

After the bents are framed and the stay lath set, the rock fill is placed for the dike. Fill material is blasted from a rock outcropping on the edge of the New Jersey meadows about 12 miles from the pier site. Two track drills and two 600 compressors are used in the drilling unit. A P&H 955A shovel loads twenty trucks that haul the rock by way of the New Jersey Turnpike to a crusher set up on the north side of Elizabeth Channel. A set

(Continued on next page)

Want to make sure of your profits  
and save valuable construction time?

New steels are  
born at  
Armco



Armco Construction Service crew installs Armco MULTI-PLATE® Pipe conveyor housing in California.

For Strength  
Durability  
Economy



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Armco Construction Service, for the past 30 years, has provided skilled crews and equipment to handle specialized jobs quickly and economically. Send coupon for details on this service. Armco Drainage & Metal Products, Inc., 4111 Curtis Street, Middletown, Ohio.

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**ARMCO** Drainage & Metal Products

For more facts, use coupon or Request Card at page 18 and circle No. 313



Some 2,000 tons of rock is loaded onto a deck scow in about 4 hours by a 200-foot Lippman belt conveyor. On the railroad car float are the contractor's trailers and change houses. Storage barges are anchored in the channel.



A Lima 1250 with Owen clamshell bucket places rock fill for the dike. Note how pile cutoffs are being used as temporary fenders for protection against damage by marine equipment while the pier is under construction.

## How Allis-Chalmers puts horsepower where it's needed—cuts contractors' costs



By keeping friction to a minimum in all moving parts of their compact HD-16, Allis-Chalmers engineers produced a machine that works right along side higher rated crawlers. The HD-16 heavy-duty model has 58 Timken® tapered roller bearings to practically eliminate friction in bevel gear and clutch shaft, final drive pinion, intermediate and sprocket shafts, track idlers, support rollers and truck wheels. The result is that

more of its 148 horsepower is delivered to the tracks—where it counts.

By making the most of the available horsepower, with Timken bearings to roll the loads, Allis-Chalmers gives contractors more *work power*—enables them to use a compact, less expensive machine for the job, increase their profits.



**BEARING ENGINEERING ASSISTANCE**, early in the design stage, helps manufacturers stretch bearing dollars. Timken bearing sales engineers have the training and are eager to help you with on-the-spot engineering service.



**METALLURGICAL LAB** develops the steels that will make tomorrow's Timken bearings last even longer, helps customers design more economically.



The Timken Roller Bearing Company, Canton 6, Ohio. Cableaddress: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ontario.

(Continued from preceding page)

of Howe scales checks truckload tonnage. The contractor uses a Lippman Grizzly King 32 x 40 jaw crusher for sizing the stone and a 200-foot conveyor for loading it on deck scows.

Spex call for two stone sizes: a 6-inch maximum for the dike core and a 3-inch maximum for the 3-foot filter blanket. The crusher and conveyor combine to load a 2,000-ton-capacity deck scow in about four hours. Normally, trucks dump directly into the crusher, but a stockpile of about 5,000 yards is maintained to take up the slack in case there should be a delay in rock delivery. In that event, a Bucyrus-Erie 54-B shovel and a Cat D6 dozer keep stone moving from the stockpile.

Four scows are used; when they are loaded, they are moved across the channel two at a time to the pier area. Unloading is done by two barge-mounted crawler rigs—a Lima 1250 and a Manitowoc 3900—both equipped with Owen 3-yard clamshells.

### Rebars come by barge

Reinforcing steel comes to the job from the Bethlehem Steel Co. plant on Newark Bay at Elizabethport, N. J. Bars are loaded onto a barge at the mill and towed by tug to the job site. Tied up alongside the ironworkers' fabricating barge, the supply barge is moved along as the work progresses. In this manner, over half the total reinforcing requirement of 2,200,000 pounds is available at the site without rehandling.

### Metal forms

Because of tight work space and tidewater, Horn will use Granco S-I-P metal forms for cap-beam bottoms and the decks. Stripping will be eliminated, since the forms will remain in place. Made of 24-gage corrugated metal, the sheets are 2 feet wide and 13 feet long. They can be field-cut to meet certain dimensions.

### Transit-mix concrete

The Colonial Sand & Gravel Co. will supply transit-mix concrete for the deck and caps from its Newark plant. About 2,500 feet of haul road will be built to get the mixers to the job site. Placing will be done by a

**CONTRACTORS AND ENGINEERS**

crawler crane mounted on a 300-foot railroad car float. The float will be moved along between the inshore side of the piers and the edge of the marsh. Finger ramps will be built out from the haul road at 500-foot intervals to bring the mixers within crane reach.

Contract quantities for the piers include the driving of 96,000 linear feet of Greenheart piles shipped in from British Guiana, and 297,000 feet of creosoted pine piles. Over 430,000 tons of stone will go into the dike. About 19,000 yards of concrete will be used for cap beams and decks.

#### Floating offices

The contractor's administrative, engineering, and maintenance force is set up in trailers and portable buildings mounted on barges. Key personnel travel around the project in small powerboats. An RCA radio base set is installed in the main office trailer, and field sets are on tugs and pile rigs.

#### Personnel

For the Port of New York Authority, Herbert J. Frank is the resident engineer and Ed Reilly his assistant. Nils Danielson is general superintendent for Horn. Phil Brouillet and Art Gould are his assistants.

THE END

#### Building code includes prestressed concrete

The inclusion of prestressed concrete into the Uniform Building Code was formally approved by the International Conference of Building Officials at its recent convention in Colorado Springs, Colo.

Prior to their formal adoption, the provisions of the code relating to prestressed-concrete construction were approved by the Structural Engineers Association of California.

#### American Pipe acquires; names sales executive

American Pipe & Construction Co., Monterey Park, Calif., has acquired Sterling Concrete Pipe Co., Madison, Calif. Both firms manufacture pipe for water mains, sewerage lines, and drainage systems. The Madison plant will retain present management.

Donald N. Chamberlain, former executive vice president of the Southern Pipe Division of U. S. Industries, Inc., has joined American in an executive sales capacity. His headquarters will be at Monterey Park.

#### Gardner-Denver moves Chicago branch office

Gardner-Denver Co., Quincy, Ill., manufacturer of compressors, rock drills, pumps, and air tools, has moved its District 5 headquarters to 2535 South 25th Ave., Broadview, Ill.

The new 9,800-square-foot structure has an 1,800-square-foot parts area. A complete line of popular sizes of Gardner-Denver equipment will also be stocked.

District 5 includes the northern third of Illinois, the southern half of Wisconsin, and 2 counties in Indiana.

#### PCA film on constructing cement-treated subbases

"Cement-Treated Subbase for Concrete Pavement," a 16-mm film describing the methods used to construct cement-treated subbases, has been released by the Portland Cement Association, Chicago, Ill.

The 11-minute sound and color film illustrates "between-the-forms" construction as used in California, as well as the mixed-in-place and central plant-mix methods.

The movie is available on loan in the United States and Canada from PCA, 33 West Grand Ave., Chicago 10, Ill., and through the association's 35 district offices in major cities of the U. S., including Hawaii, and in Vancouver, B. C.



If it can be moved...  
there's a  
**MANITOWOC**  
to lift it

Fraction-of-an-inch control is provided by this Model 2900 60-ton capacity Truck Crane.

Why have Manitowocs gained a world-wide reputation as the "Cadillacs of construction cranes"? Because contractors everywhere know that on any lift crane job — steel erection, concrete pouring, bridge construction — the work will go faster and easier with a Manitowoc. They know that Manitowoc engineers have been specialists in crane design for over 30 years. They know that quality Manitowoc components will give them years of reliable lift crane service with the least maintenance and time loss.

You get a simple, direct power train that eliminates wasted energy and provides a reserve lift capacity when you need it most. There's outstanding stability from a solid foundation for high, heavy lifts. Smooth performing disc clutches, fast-acting brakes, and 3-stage torque converters help to provide precise, positive control. And you get profitable all-job use because every Manitowoc is easily convertible to clam-shell and dragline attachments... several to shovel and trench hoe.

Get more information today on the most complete line in Manitowoc's history. Mail the coupon now!

TRENCH HOES  
1 1/4 to 3 TBS.

SHOVELS  
1 1/4 to 6 TBS.

**Manitowoc**

CRANES  
25 to 125 TONS

DRAWLINES  
1 1/4 to 7 TBS.



Unloading steel trusses at the site of Chicago's new Metropolitan Fair and Exposition Center is a 125-ton capacity Model 4000 crane, one of over 100 Manitowocs owned by American Bridge Division of U. S. Steel.

**MANITOWOC ENGINEERING CORP.** Dept. C&S  
(A subsidiary of The Manitowoc Company, Inc.)  
MANITOWOC, WISCONSIN

Please send details on the following Manitowoc cranes:

CRAWLER-MOUNTED		TRUCK CRANES
<input type="checkbox"/> 25 ton	<input type="checkbox"/> 65 ton	<input type="checkbox"/> 45 ton
<input type="checkbox"/> 35 ton	<input type="checkbox"/> 100 ton	<input type="checkbox"/> 60 ton
<input type="checkbox"/> 50 ton	<input type="checkbox"/> 125 ton and up	
<input type="checkbox"/> 60 ton		

Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

For more facts, use coupon or Request Card at page 18 and circle No. 315

The 265-foot boom and 60-foot jib of a Manitowoc 4000 crane are outlined in the canyons of New York City's financial district, where the rig is working on a reinforced-concrete office building. Use of the crane instead of an elevator for hoisting purposes saved man-hours and money on the job.



### Crane reaches 325 feet on office-building job

■ A "big stick" helped in the speedy completion of a 24-story reinforced-concrete office building on Beaver Street in New York City's financial district. Carried by a Manitowoc 4000 with a 67-ton counterweight, the stick in question has a main boom of 265 feet, plus a 60-foot jib, for a record reach of 325 feet.

Capable of picking up 8,000 pounds at a 100-foot radius, the machine placed slings of form lumber and lifts of miscellaneous iron, concrete, etc., directly from trucks to upper floors, saving many man-hours of re-handling materials by bypassing the conventional construction elevator. This fast movement of materials enabled the contractor to complete a 12,000-square-foot floor (400 yards of concrete) every other day.

Counted among the city's tallest reinforced-concrete structures, the building was designed by Henry

George Green. Barnaby Concrete Corp. of New York was the subcontractor for concrete work, and the Depot Construction Co. of Long Island City holds the general contract.

### Report of conference on transportation

■ The National Academy of Sciences—National Research Council, Washington, D. C., has released the report of the study conference on transportation research, held under its auspices last summer at Woods Hole, Mass.

The purpose of the conference was to review the nature and ramifications of transportation activities in the United States and to suggest ways of improving national capabilities for handling transportation problems. Individuals from the transportation industry, governmental agencies, and research and professional groups presented information on present capabilities, trends, demand-and-supply estimates, and future expectations for the various methods of transport and their related industries.

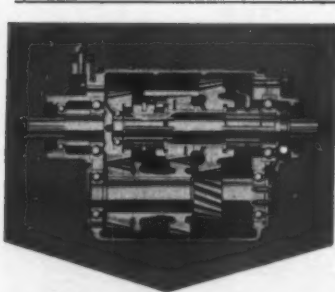
The 88-page booklet is divided into seven chapters discussing the challenge, technology, environment, and conduct of transportation; transportation facts; potentials for transport analysis; and education and training for future responsibilities. Three

appendixes are included, giving the organization of the study group, names of chapter contributors, and contents of companion reports.

The report—Publication 840—can be obtained from the printing and publishing office, National Academy of Sciences—National Research Council, 2101 Constitution Ave., Washington 25, D. C. Price for single copies is \$1.

### Regional sales manager appointed by B-L-H

■ Baldwin-Lima-Hamilton Corp., Lima, Ohio, has named Frederick H. Norton regional sales manager of the east central sales region, consisting of Ohio, West Virginia, western Pennsylvania, and eastern New York. His headquarters will be in Pittsburgh.



## Specify FULLER Specify the MODEL MODEL

For heavy duty trucks and tractors specify the FULLER '92 SERIES 3-SPEED AUXILIARY

- High capacity
- Widest range of ratios
- Top-mounted power take-off optional
- Low initial cost, reduced maintenance
- Available from all truck manufacturers on specification

92 SERIES (Heavy-Duty) RATIOS				
MODEL	SPLITTER RATIOS		DEEP REDUCTION	
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3-A-92	.74	1.00	2.09	
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3-C-92	.75	1.00	2.64	
3-D-92	.75	1.00	1.24	
3-E-92	.84	1.00	2.09	
3-F-92	.84	1.00	2.64	
3-G-92	1.00	1.327	2.09	
3-H-92	1.00	1.327	2.64	

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EATON MANUFACTURING COMPANY  
KALAMAZOO, MICHIGAN  
For more facts, circle No. 316

## DON'T PAY BIG HAULING COSTS!

just drive on - drive off any rig from 4 to 22 tons with built-to-last, low cost MILLER Tilt-Tops!

<p><b>"OTS-22"</b> 8' x 4' stationary platform with 8' x 16' or 20' long tilt section available. Gooseneck tongue. Tandem dual wheels suspended directly from tongue frame on new spring beams. 22 ton capacity.</p>	<p><b>"OTG-18"</b> Over-the-wheels 8' x 16' 6", or 20' platform available. Gooseneck tongue. Dual wheels mounted on tandem axles with oscillating walking beam suspended directly from tongue frame. 15 ton capacity.</p>	<p><b>"OT-16"</b> Over-the-wheels, 8' x 16' 6", or 20' platforms available. Eight wheels, dual assemblies, mounted on tandem axles with oscillating walking beam. 15 ton capacity.</p>	<p><b>"BT-10" &amp; "CT-7"</b> Extra low, load angle, between-the-wheels platform, 76" wide—either 14' or 16' long. Four single wheels mounted on tandem axles with oscillating walking beam. 10 ton capacity on "BT" . . . 7 ton on "CT".</p>	<p><b>"J-6", "8" &amp; "10"</b> Heavy duty over-the-wheels models. 8' x 14' platform—16' and 18' platforms available. Single axle, dual wheels. Capacity: "J-6", 6 tons; "J-8", 8 tons; "J-10", 10 tons.</p>	<p><b>"C-4"</b> Extra low loading angle, between-the-wheels platform 8' x 14', 16' platform available. Two single wheels mounted on straight-thru H beam axle. 4 ton capacity.</p>	<p><b>"M-4"</b> Over-the-wheels, 8' x 14', or 16' platform available. Single straight-thru axle, dual wheels. Completely equipped with heavy duty, first line trailer tires. 4 ton capacity.</p>	<p><b>Heavy crawlers</b></p> <p><b>Shovels</b></p> <p><b>Pavers</b></p> <p><b>Rollers</b></p> <p><b>Trenchers</b></p> <p><b>Small crawlers</b></p> <p><b>Tractors</b></p>
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You save on loading-unloading time . . . save on first cost . . . save on maintenance cost . . . save on down time cost with MILLER's full jeweled chassis, special heavy duty, first line trailer tires. You get ONE man loading in just TWO minutes . . . fast shuttle-hauls between jobs with almost any rig from large dozers to the smallest farm type tractor. Nine models from which to choose — see them at your MILLER distributor now!

See your MILLER distributor or write for FREE literature to:

**Miller Tilt-Top Trailer Inc.**

456-U So. 92nd St., Milwaukee 14, Wis.

For more facts, use Request Card at page 18 and circle No. 317

## "AIR KING"



FOR Quick, Pressure-Proof Connections ON AIR HOSE AND COMPRESSORS . . .

"Air King" Quick-Acting, Universal Type Coupling. Built on plain, rugged lines to assure long trouble-free service under all conditions. Locking heads identical for all sizes of hose or threaded ends within the "Air King" size range. To connect, press together and apply quarter-turn. Reverse to disconnect. Equipped with auxiliary locking device for added safety. Regularly furnished in bronze or rust-proofed malleable iron, but also available in special metals.



Made in Hose Ends and Male and Female I. P. T. Ends, in sizes up to 1".

### FOUR-LUG STYLE



Same as above in locking action, but for larger hose sizes. Hose ends and I. P. T. Ends in sizes 1 1/4", 1 1/2" and 2".

Stocked by Manufacturers and Distributors of Mechanical Rubber Goods

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DIXON VALVE & COUPLING CO. LTD., TORONTO, CANADA

For more facts, circle No. 318

CONTRACTORS AND ENGINEERS

# PRODUCT PARADE

For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.

## Heavy-duty ditcher for pipeline work

A full-crawler wheel ditcher for heavy-duty cross-country pipeline work, which is designed to dig 54 inches wide and 8 feet 6 inches deep, is announced by Barber-Greene.

Known as Model 777, this machine features one-lever control while digging on the straightaway; permits an infinite range of crowding speeds from zero to 33 fpm; and allows the machine to turn around within its own length while maneuvering into or out of position.

For further information write to the Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 238.

## Three utility rigs in '61 tractor line

Three new utility tractors and a new yellow color design are featured in the Allis-Chalmers 1961 line of utility tractors and matched utility equipment. These units are the D-15 wheel tractor and the H-3 and HD-3 crawler models.

Manufacturer's rating for the D-15 is 48 horsepower. The H-3 (43 horsepower) and the HD-3 (40 horsepower) are both in the 6,000-pound weight classification.

Write to the Allis-Chalmers Mfg. Co., Dept. C&E, Box 512, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 240.

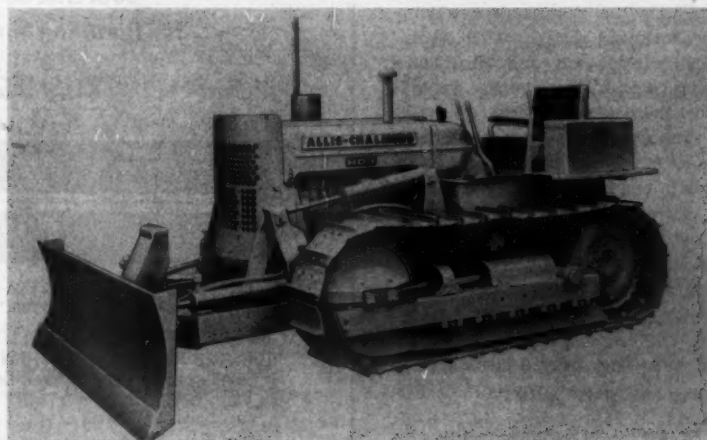
## Rubber-tire dozer converts to loader

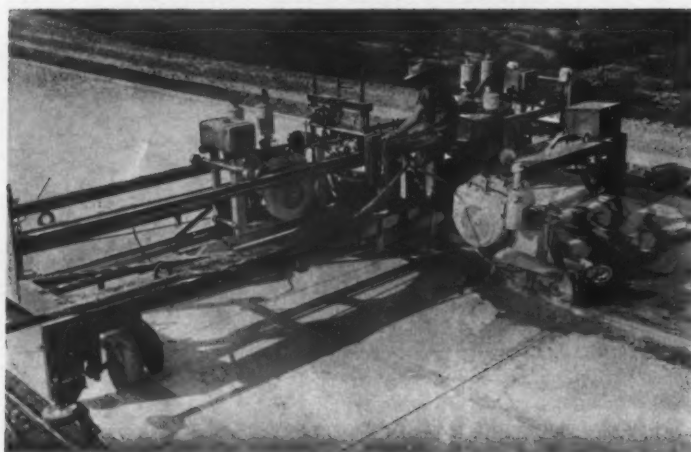
The Frank G. Hough Co. offers the first model of its new Paydozer line, the D-120.

Designed (as an option) to be easily converted into a front-end loader whenever necessary, this unit is powered by a 300-hp turbocharged diesel engine and weighs 55,000 pounds.

The blade action includes lifting and lowering, forward and backward pitch, as well as side tilt.

For further information write to The Frank G. Hough Co., Dept. C&E, 762 Seventh Ave., Libertyville, Ill., or use the Request Card at page 18. Circle No. 239.





Sawing transverse and longitudinal joints with one machine—the Jointmaster 2400—speeds work on this stretch of pavement in Los Angeles County.

### Automatic joint cutter speeds pavement work

A longitudinal sawing attachment for the Jointmaster Model 2400, designed to permit the machine to cut both transverse and longitudinal joints in hardened concrete highways and airstrips, is announced by Concut Sales, Inc.

Strips from 18 to 25 feet wide can be sawed with the automatic machine, which uses six saws edged with small natural diamonds to cut thin, precise joints in concrete. One man operates the machine.

Four diamond saws, each traveling a maximum of 6¼ feet, cut the joint across the pavement. Then, as the machine moves forward to the position for the next transverse joint, two diamond saws mounted behind the machine cut the longitudinal joint. A tank truck supplies water to cool the diamond wheels.

The longitudinal sawing attachment is powered by a separate Wisconsin engine.

For further information write to Concut Sales, Inc., Dept. C&E, 1845 N. Belcroft Ave., El Monte, Calif., or use the Request Card at page 18. Circle No. 9.

### Surveying instruments are compact units

A new line of instruments featuring compact size and light weight is offered by David White.

These instruments are called the Continental No. 8040 level-transit and No. 8050 level.

On both instruments, the circle rotates for zero settings and reads to degrees. Both instruments have 8X power telescopes with micrometer ring focusing.

The 8040 level-transit features a positive-level locking device that quickly secures the telescope in a true level position. It weighs 2 pounds and stands 6 inches high. The 8050 level weighs under two pounds.

For further information write to the David White Instrument Division, Realist, Inc., Dept. C&E, Menomonee Falls, Wis., or use the Request Card at page 18. Circle No. 20.

### Adapt dustless air drill for anchor placement

Adaptation of the Thor 15DL dustless air drill as a combination drill and hammer for placing concrete anchors in all types of building construction has been announced by the Thor Power Tool Co.

The Thor air drill utilizes a dust-inhaling system that draws the drilling dust through the unit and into dust extractors while the anchor hole is being drilled. Then the drill converts to hammer action by simple turn of a "stop rotation" lever, an expansion plug is fitted to the bit end of the anchor, and in a matter of seconds the anchor is permanently set in

concrete by a series of hammer blows. A quick sideward push on the tool removes the snap-off taper of the anchor, and it is ready for the bolt for which it was placed.

The Thor dustless air drill is available for this type of application with adapters for concrete anchor sizes from ¼ to ¾ inch, and with the dust-extractor unit that attaches to the drill.

For further information write to the Thor Power Tool Co., Dept. C&E, 175 N. State St., Aurora, Ill., or use the Request Card at page 18. Circle No. 24.

## NOW ... From GOODALL *The* in HEAVY-DUTY CONVEYOR

### "LONG-LIFE" \* Tensilized Nylon BELTING

An entirely new belting construction, with a carcass consisting only of plies of \*Tensilized Nylon instead of the usual woven fabric.

Guaranteed to last longer than the finest belting you have ever used, for handling the roughest and heaviest loads:

CRUSHED ROCK, TUNNEL MUCK, ORES, DOLOMITE



- (A)—Rubber or Synthetic Top and Bottom Covers. (Reversible)
- (B)—Breaker strips.
- (C)—Two Plies of \*Tensilized Nylon... Stranger than Five Plies of Heavy-duty Belt Duck.

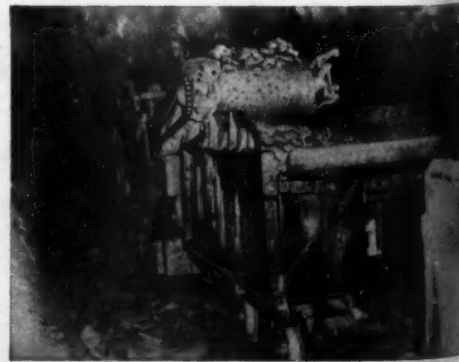
If you are now using the best belting you can buy and still paying a high cost for short belt life, frequent downtime for repairs, stretch taking, etc., Goodall \*Tensilized Nylon Belting is your answer. You will welcome this amazingly strong belting that's guaranteed to cut your belt replacement costs to an unprecedented low.

### Here's What This New Belting Means in SAVING

In cases of severe service, where present belt life may now be measured in months, "Long-Life" \*Tensilized (Oriented) Nylon Belts will increase that life, reduce the cost per ton of material carried and eliminate downtime for repairs.

In the toughest of all services—tunnel mucking—"Long-Life" \*Tensilized Nylon Belting will last two to three times longer without breakdown, handling increased tonnage at a new low cost per cu. yd.

**EXAMPLE**—A prominent Contractor reports 60,000 cu. yds. of excavated rock handled on a length of Goodall \*Tensilized Nylon Mucker Belting where only 20,000 to 30,000 cu. yds. could be handled on belts previously used on this tough tunnel job. What's more, there was no downtime with the new belt.



## Mobile belt loader features high capacity

The Western Conveyor Co. has introduced a high-tonnage mobile belt loader that is capable of pouring 3,500 tph of material into hauling units.

Special features of this Wescon loader are a continuous-running belt and internal hydraulically operated gate control and feeder. The positive hydraulic cutoff of the discharge gate and feeder reportedly prevents dribbling or spilling of materials between loading discharges, and the continuous-running belt eliminates shear and starting load.

Another feature is the location of the fifth-wheel pin under the discharge end, permitting hookup and movement by truck without crane lift or tractor pullout. The unit is equipped with tandem dual wheels to carry its 64,000-pound bulk, and is hauled intact by standard hauling equipment as a permit load.

According to the manufacturer, the load can be set up by a 2-man crew and be ready for operation in about two hours.

For further information write to the Western Conveyor Co., Dept. C&E, P. O. Box 357, Boise, Idaho, or use the Request Card at page 18. Circle No. 225.



The 60-inch belt of this Wescon loader is driven by a Schrock 75-hp motorized pulley. The pulley and 20-hp feeder drive are operated on either line or generated power.

# ALL This Revolutionary Advance FOR BELT CONSTRUCTION!

## TIN "LONG-LIFE" \* Tensitized Nylon BELTING

### Typical Applications...

WHERE LONGER SERVICE MEANS  
Big Savings IN OVER-ALL COSTS:

Construction—Conveying crushed rock in largest  
On mucking machines in tunnel excavating,  
where severest shock and abrasion are encountered.

Quarrying—Conveying crushed rock and stone, trap  
and heavy limestone.

Mineral Processing—Handling primary and secondary crushed  
ores, iron, copper and quartz ores, run-of-mine coal.

Building this new belting with a stronger \*Tensitized Nylon carcass  
instead of the customary fabric carcass, Goodall offers the only basic  
improvement in conveyor belt construction in many years. It provides  
advantages that are virtually impossible with conventional constructions,  
adding up to longer belt life under the severest load conditions  
encountered in any service. It will out-last the best conveyor  
belting you have ever used, and eliminate the usual costly downtime  
for repairs.

Tensitized (Oriented) Nylon, adapted to the manufacture of  
conveyor belting by Goodall Rubber Company, is produced by  
Chemical Co., and processed by Moldings & Extrusions, Inc.

### Guaranteed TO HAVE GREATER RESISTANCE TO THE FOLLOWING:

Abrasion—Impact—Cutting—Tearing—In-  
ternal Rupture—Edgewear—Fastener Pull-  
out. It will not rot or deteriorate in strength  
due to moisture penetration. It is built to  
retain excellent troughing and cover ad-  
hesion. Downtime for stretch take-up is  
practically eliminated.

**GOODALL RUBBER COMPANY**  
Whitehead Road, Trenton 4, N. J.  
Please send complete information on "Long-  
Life" Tensitized Nylon Belting for handling

Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_  
Alt. of \_\_\_\_\_

Contact our nearest branch or mail coupon  
for complete information. Be sure to state  
nature of material handled.

**GOODALL**  **Rubber Company**

General Offices and Factory, Trenton 4, N.J.

Branches Throughout the U.S. and in Canada

Manufacturers of Mechanical Rubber Goods Since 1870

## New technique measures hot aggregate in bins

A device for measuring hot asphalt aggregate in bins is announced by PolyTech Research, Inc.

Designated Measurfil, this system consists of two sections. A rugged, simple system of motors, belts, pulleys, cables, and microswitches is used in the bin area where the dust and vibration is most severe. Connected to this—at a more remote location where it can easily be read—is an electronic read-out unit.

Tension operates the system. A weight at the end of a cable is raised and lowered by a reversible motor. The other end of the cable is wound on a drum. When the weight drops and reaches the level of the fill in the bin, the tension on the cable relaxes and causes the motor to reverse. The motor then pulls the weight to the top of the bin where it hits a stop which then increases tension on the cable, operating another microswitch that reverses the motor again.

Measurement is taken when the weight reaches the fill level. Voltage off a potentiometer attached to the drum goes to the read-out unit where the information is stored on a "memory cell." Simultaneously, it appears on the meter in read-out form. It can also be recorded at the same time.

For further information write to PolyTech Research, Inc., Dept. C&E, 2009 Kuhl Ave., Orlando, Fla., or use the Request Card at page 18. Circle No. 220.

## Lightweight heater provides 75,000 Btu

The Master Vibrator Co. offers a new, lightweight portable heater with a capacity of 50,000 to 75,000 Btu per hour.

After the dial is set for the amount of heat needed, a flip of the switch ignites the fuel and operates the heater. It runs on kerosene or No. 1 fuel and plugs into any 115-volt ac outlet.

An automatic fan cutoff control allows the combustion chamber to cool and then turns off the fan.

For further information write to the Master Vibrator Co., Dept. C&E, 1752 Stanley Ave., Dayton 1, Ohio, or use card at page 18. Circle No. 232.



United Air Lines new base at Chicago's O'Hare Field

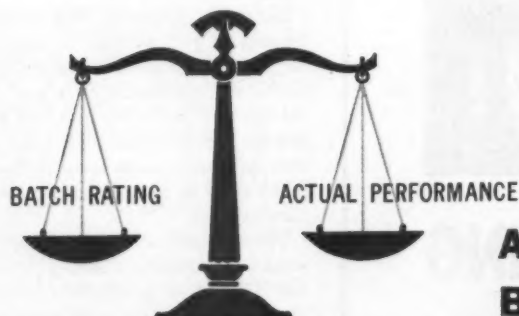
#### Symons Forms Used to Pour Reservoir

Wm. E. Schweitzer Construction Company, Evanston, Illinois used Symons Forms to pour a Reservoir 200' long by 58' wide by 17' high. Approximately 1/2 of the walls was poured in one operation. The entire hangar is resting on a 2'9" base pad which was also poured with Symons Forms. Symons Column Clamps were used to form columns.

Symons Forms are rented with purchase option.

Symons Clamp & Mfg. Co., 4251 Diversy Avenue  
Dept. A-1, Chicago 39, Illinois

For more facts, use Request Card at page 18 and circle No. 320



## A BALANCED 8000 lb. Bituminous Batch Plant?



*We think so, and invite you to check some of the features of our T-80 Plant*

112" dia. x 40' long dryer with automatic 750 GPH low pressure oil burner

3 1/2" deck or 4 1/2" deck 5' x 16' gradation screen with vibration dampers and reversing switch on stop control

80 ton hot bin (120 tons optional), 4 or 5 compartment, as required

450 GPM jacketed A/C pump, with bypass, strainer, and relief valve assembly

Positive fugitive dust control and hot bin ventilation with separate exhaust

Jacketed twin shaft pugmill mixer, 83 cu. ft. vol. below center line of shafts

18 x 10" A/C buckets w/ 12" centers on all steel chain

Air compressor permanently mounted in mixing tower framing

Stairways to all platforms and walkways on mixing tower

Factory installed wiring, with control house built as an integral part of mixing tower structure

Automatic weighing and remote control available, all plants

**H & B offers plants BALANCED for 80 BATCH-PER-HOUR PRODUCTION, in sizes through 12,000 lb. batch rating**

**HETHERINGTON & BERNER, INC.**  
A Wholly Owned Subsidiary of American Hoist & Derrick Company  
**Engineers**  
Manufacturers

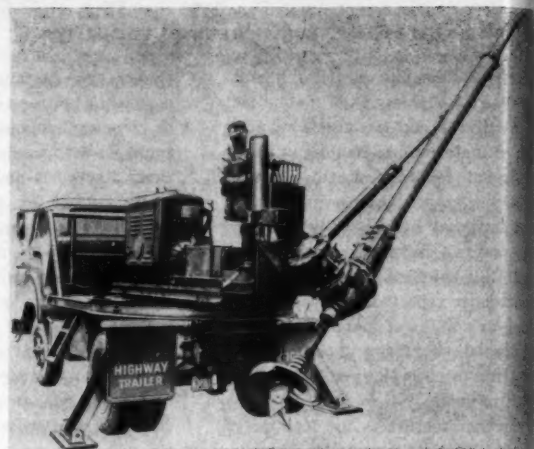
701 KENTUCKY AVE. • INDIANAPOLIS 7, IND.  
Export Dept.: 205 W. Wacker Drive, Chicago, Illinois

**TOWER TYPE BATCH PLANTS in 8 sizes**  
**MOBILE TYPE BATCH PLANTS in 6 sizes**  
**BASE STABILIZER PLANTS in 2 sizes**  
**MOTO-PAVER, the travelling combination Mixer and Paver (cold mix)**

Cable Address: Panmatina

For more facts, use Request Card at page 18 and circle No. 321

**Product Parade—THESE PRODUCTS CAN HELP WIDEN YOUR PROFIT MARGIN**



Designed for installation on standard truck bodies, HCBMS earth-borers provide a wide range of digging angles.

### Earth-boring machine digs hole 35 feet deep

A new fully hydraulic earth-boring machine for digging holes up to 4 1/2 inches in diameter and 35 feet deep has been announced by the Utility Division of Highway Trailer Industries, Inc.

The HCBMS digger is equipped with all-way hydraulic or mechanical power leveling to provide a wide range of digging angles. All controls are easily accessible from a comfortable full-swing swivel seat.

Other features include versatile, perfectly aligned winch, accessible hand shift and foot clutch, new adjustable clutch, and hydraulic controls.

HCBMS earth-borers are mounted on new, more powerful swing or spotter bases, with hydraulic stabilizers, for installation on standard truck bodies. Power supply for portable electrical tools is provided from Generac 110 to 220-volt access outlets.

For further information write to the Utility Division, Highway Trailer Industries, Inc., Dept. C&E, Stoughton, Wis., or use the Request Card at page 18. Circle No. 223.

### Two new models added to portable-heater line

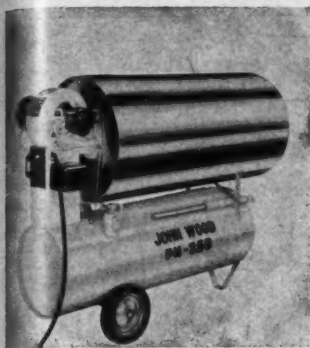
Two new portable heaters, the PH 350 and PH 80, are offered by the John Wood Co.

The units deliver 350,000 and 80,000 Btu, respectively. They need no vents and are equipped with fold-back stainless-steel combustion chambers to assure complete combustion and to eliminate odor, smoke, and visible flame. They burn kerosene, and No. 1 or No. 2 diesel or fuel oil. A stroco-type blower provides positive air flow.

Standard features on the Model 250 include automatic control with an automatic safety cutoff. Its 3/4-hp motor operates on 110 to 120-volt ac. Dimensions are: length, 57 inches; width, 23 inches; height, 46 inches. The unit can be operated continuously for 16 hours, according to the firm.

The Model 80 is said to operate for 20 hours on one tank of fuel. Model 80 dimensions are: length, 38 1/2

**CONTRACTORS AND ENGINEERS**



inches; width, 15¾ inches; height, 27 inches.

For further information write to the John Wood Co., Heater and Tank Division, Dept. C&E, Conshohocken, Pa., or use the Request Card that is bound in at page 18 of this issue. Circle No. 22.

### New flotation tire has highway tread

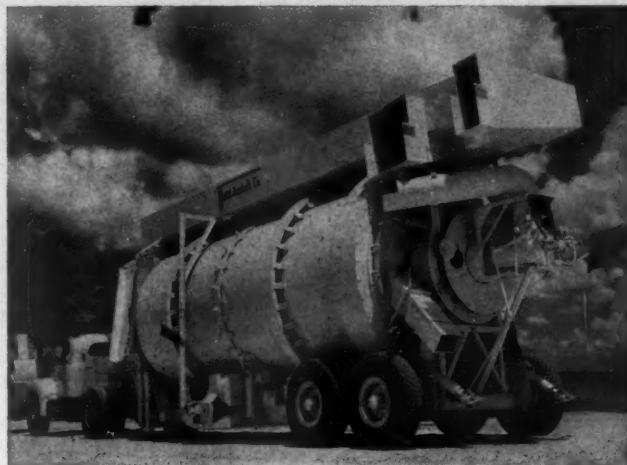
A new tire, said to combine off-the-road advantages of flotation tires with long mileage in highway service, has been introduced by the Harro Tire & Rubber Corp. for use on transit-mix trucks, batch trucks, and water buggies.

Called Flo-Track, the tire permits mixer and batch trucks to move freely from highway to difficult off-the-road terrains, such as sand, muck, or hill-sides, without slowing down and without a change of tires.

In addition, single 18.50 × 20 Flo-Track tires may be used to replace standard duals on single or tandem rear axles. Carrying capacity of the single tire is 23,000 pounds.

Write to the Harro Tire & Rubber Corp., Dept. C&E, 1800 W. Fort St., Detroit 16, Mich., or use the Request Card at page 18. Circle No. 231.

Portability is a major feature of the new continuous-mix, high-capacity asphalt plant offered by Barber-Greene. Basically a Model 848-A plant, it may consist of any necessary number of plant components, as the job demands. Accessory and optional equipment are said to add an unusually high degree of portability, ease and speed of erection and dismantling, and more efficiency in operation. For further information write to the Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 172.



# RENT

## GALION® Rollers....

and profit from these advantages

- 1 The rollers you need—WHEN you need them for peak seasonal and job demands. A complete selection of sizes and latest Galion Roll-O-Matic models—Tandem, Three-Wheel, and Pneumatic-Tire Rollers.
- 2 Eliminate the headache of IDLE roller equipment eating up profits.
- 3 Free your working capital for other important needs.
- 4 Improve your credit resources.
- 5 Simplify cost and tax records—reduce "book work."
- 6 Rental costs are tax deductible from ordinary income.

Write for complete information on the GALION Roller Rental Plan today.

THE GALION IRON WORKS & MFG. CO.  
General and Export Offices—Galion, Ohio, U.S.A.



**GALION®**  
ESTABLISHED 1907

**MOTOR GRADERS & ROLLERS**  
VIBRATORY COMPACTORS • PNEUMATIC TIRE ROLLERS



For more facts, use Request Card at page 18 and circle No. 323

### EFCO FLEXIBLE

#### Form Panels

Round concrete tanks or curved walls may be quickly formed by combining EFCO Flexible Steel Form Panels with regular EFCO Steel Forms.

For angles of any degree, EFCO Flexible Angle Form Panels make the job easy.

ASK FOR COMPLETE INFORMATION

MAIL TODAY

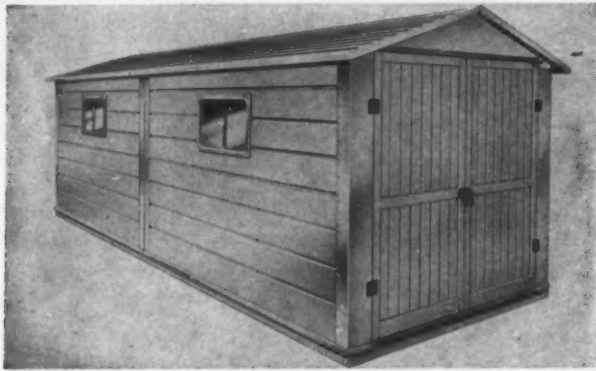
EFCO ECONOMY FORMS CORP.  
Box 128-E, H. P. Station  
Des Moines, Iowa

Please send catalog showing EFCO Flexible and Regular Form Panels, and address of nearest sales office.

Name.....  
Firm Name.....  
Address.....  
City..... State.....

For more facts, use coupon or circle No. 322

JANUARY, 1961



Constructed of heavy-gage steel, the basic Pennington Add-On building units are available in multiples.

### Expandable field office made of heavy-gage steel

The new Pennington expandable Add-On field-office units are constructed of heavy-gage steel that has been bonderized and zinc-coated to assure years of weather protection.

A basic building unit measures 8 x 11 feet at the eaves; clear inside headroom, 6 feet 5 inches; height at peak, 7 feet 3 inches. Doors open to a

width of 72 inches.

The units may be purchased in multiples as desired, with double doors in one end or both ends and with or without windows.

For further information write to the Pennington Mfg. Co., Dept. C&E, Addison, Ill., or use the Request Card at page 18. Circle No. 55.



## BIGGEST VALUE

The modern Allis-Chalmers HD-16 crawler tractor has the horsepower, weight and draw-bar pull needed to handle most tractor jobs on your big spreads. With it, you stay in the same horsepower class as the biggest tractors available a few years ago and save the extra cost of moving up to "extra big" machines.

Look at the HD-16... watch it work... compared to any other crawler and you'll be convinced dollar for dollar, you can't buy a bigger producer. is an up-to-date power package that converts 150 hp at the flywheel to as much as 60,000 lb of draw-bar pull. With bulldozer, more than 19 tons of "action" weight go to work moving material profitably than any of your older "big" tractors. With today's HD-16's, you maintain the balance of your spread and add greater ease of operation and maintenance that keeps building production.

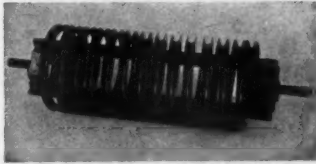
...move ahead with

### Kit for rebuilding rotary-broom cores

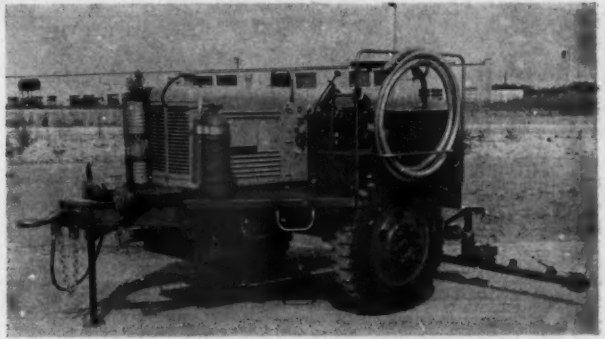
A kit for rebuilding worn-out, discarded rotary-broom cores has been announced by Ben-Ko-Matic, Inc.

The kit consists of a 16-gage steel spiral weighing about 50 pounds crated. It is available in 10 and 12-inch-ID standard sizes and in any length, to fit most popular makes of cores.

Reconditioning of worn-out cores with the Ben-Ko rebuild kit is said to be simple and fast.



For further information write to Ben-Ko-Matic, Inc., Dept. C&E, 8028 N. Jersey St., Portland 3, Ore., or use the Request Card at page 18. Circle No. 44.



The bituminous distributor is stripped down to its bare essentials in this trailing tankless type, developed by the Seaman Corp., for more payload.

### Bituminous distributor towed by supply truck

A new tralling, tankless-type bituminous distributor has been introduced by the Seaman Corp.

The unit is towed by the bituminous supply truck from which the distributor draws its material. The full-circulating spraybar folds vertically and swings horizontally toward the rear for protection, should the bar strike an obstruction. Extensions can be added to increase spraybar length from its basic 12 feet to 24 feet. Nozzles are spaced 4 inches apart.

All functions of a modern bituminous distributor are accomplished by a new master-control valve, states the company.

For further information write to the Seaman Corp., Dept. C&E, P. O. Box 3025, Milwaukee 18, Wis., or use the Request Card at page 18. Circle No. 34.

### Air-line oilers feature extra-large capacity

The Gardner-Denver Co. has introduced two models of air-line oilers built for heavy-duty field service.

Models LO-30 and LO-50 are large-reservoir line oilers having capacities of 3 and 5 gallons, respectively. They



are especially designed for use with heavy equipment—big drills, tunnel jumbos, and other large rigs.

The manufacturer points out that these extra-large-capacity air-line oilers provide longer continuous operation of equipment without refilling the oiler. In addition, the wide range of air capacity makes them ideal for use with one or more drills.

The LO-30 operates within a range of 175 to 600 cfm. The LO-50 operates in the 200 to 800-cfm range.

For further information write to the Gardner-Denver Co., Dept. C&E, S. Front St., Quincy, Ill., or use the Request Card at page 18. Circle No. 51.



## UN 150-HP CLASS

... convinced you. Whether you are replacing outmoded tractors moving up to more power, you will find it to your advantage to check the tremendous working range of low-cost, big tractor—the Allis-Chalmers HD-16. These advantages in action: industry's healthiest ... toughest track ever built ... torque converter material gear drive ... permanently lubricated truck wheels, rollers with tapered roller bearings. Call your Allis-Chalmers construction machinery dealer for a demonstration. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



Now available in Persian Orange or Allis-Chalmers Yellow at no extra cost.

# ALLIS-CHALMERS

power for a growing world

For more facts, use Request Card at page 18 and circle No. 324

Designed for use on the Oliver Model 880 wheel tractor, the Ware Model 800 hydraulic trencher features a 9/16-yard capacity. The cab is optional.



### Hydraulic trencher for wheel tractor

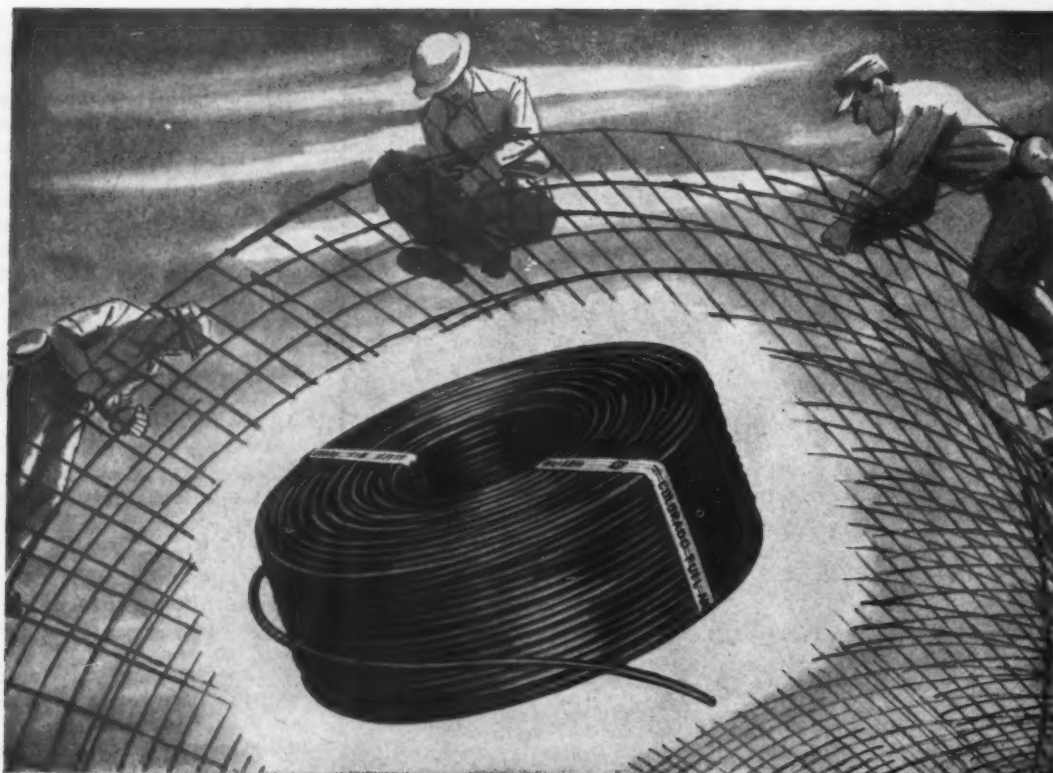
A 9/16-yard hydraulic trencher has been introduced by the Ware Machine Works for use on the Oliver Model 880 wheel tractor.

Designated Model 800 Hydro Trencher, the unit has an uninterrupted arc swing of 180 degrees, a breakaway capacity of 10,400 pounds, and a maximum digging reach of 21 feet 11 inches. The machine is supplied with or without cab.

The Model 800 features full-vision

operator positioning, multi-speed control of boom and dipper stick, power-locked stabilizers, new camelback design of boom, straight-in-line cylinder power, hydromatic control of all boom operations, and many other new or improved features.

For further information write to the Ware Machine Works, Dept. C&E, Ware, Mass., or use the Request Card that is bound in at page 18 of this issue. Circle No. 213.



## Tie more re-bars safely ...with Cal-Tie Wire in the handy reel

Still using the old-fashioned, shoulder-coil method for tying re-bars? Then it's time to switch to the modern way — Cal-Tie Wire in handy, light-weight dispensers. Your crews will be able to tie more re-bars per hour ... in greater safety ... resulting in a lower per-ton cost for placing steel.

Designed to be worn on the belt — on either the right- or left-hand side — the Cal-Tie reel is always within instant reach, yet never in the way. Because it frees both hands for productive work, tying is faster and more accurate. Wires can't get tangled or kinked ... can't be left underfoot to cause falls ... can't

cause dangerous eye or facial injuries. And, because the wire is used in a dispenser, less is thrown away as unused ends — waste is kept to a minimum.

Together, Cal-Tie Wire and the handy dispenser make a valuable cost cutting team that weighs only approximately five pounds. Cal-Tie Wire — the safe, sure way to secure re-bars — comes tightly coiled, 20 coils to the carton, to save you storage space. It's available in stock in 16 gage, annealed or galvanized; other sizes 14-20 gage upon request. For complete information, call your nearest CF&I dealer.

### CAL-TIE® WIRE

THE COLORADO FUEL AND IRON CORPORATION

In the West: THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N.M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita  
In the East: WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia

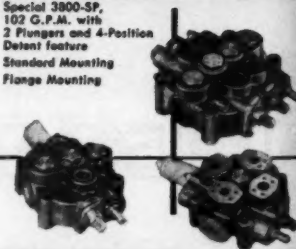
CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

For more facts, use Request Card at page 18 and circle No. 325



### New Multi-Position, Power-Saving FLUID CONTROL

Special 3800-SP,  
102 G.P.M. with  
2 Plungers and 4-Position  
Detent feature  
Standard Mounting  
Flange Mounting



### HUSCO HYDRAULIC MULTI-PLUNGER VALVES

HUSCO Valves give you up to FOUR Control Positions — Raise, Lower, Float and Neutral, with or without Detent — for unusual advantages in versatility and performance. Available to control up to SIX cylinders, single or double acting, with Power-Saving Relief Valve. Capacities from 3 to 185 G.P.M. Over 120 standard models, with unlimited modifications to fit your specific need.

Get the whole story of HUSCO Features and advantages. Write for your copy of HUSCO'S "House of Ideas" — and engineering aid on your control needs.

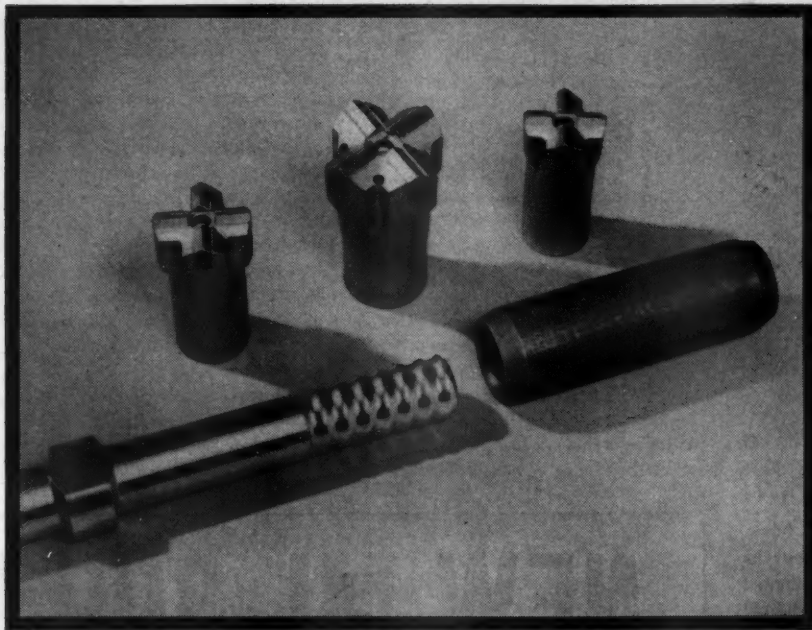
#### HYDRAULIC UNIT SPECIALTIES CO.

PUMPS • VALVES • CYLINDERS  
P. O. Box 237-E, Waukegan, Wisconsin

West Coast Representatives:  
EASTMAN PACIFIC CO., Los Angeles, Calif.  
ROY BOBBS AIR-DRALIC CO., Portland, Ore.

For more facts, circle No. 326

CONTRACTORS AND ENGINEERS



## **Here's proof Coromant rope-thread bits and steels SAVE TIME AND MONEY !**

- "Up to double the footage between sharpenings!"***
- "Premature rod breakage is almost non-existent!"***
- "40% more usable life—more resharpenings!"***
- "Bit and rod life are well above average!"***
- "Uncouple by hand all the time!"***
- "More rigid—drills straighter holes!"\****

*\*Names of men quoted available on request*

The comments above are actual quotes from project managers, job superintendents, and drill superintendents who have tested new Coromant, rope-thread bits and steels. They've learned, on-the-job, the benefits they—and you—can expect!

For example: The new rope-thread (only two turns per inch) holds tight in use, yet permits hand uncoupling. Reports show that the time saved results in more footage drilled per shift. Bit footage is well above average too, with less loss of carbide inserts. Prime quality ore plus nickel-chrome alloy permits cold-rolling from billets for greater strength, life and rigidity. And only with Coromant rope-thread steels can you re-thread without heat treating, too. Do it yourself, or at any nearby machine shop.

Want to know more? There's no obligation on your part, but we'll be glad to help where we can. Just call your nearest Atlas Copco Office, or write to us at Dept. CAE-7.

### ***Atlas Copco***

610 Industrial Avenue  
Paramus, New Jersey  
COifax 1-6800

930 Brittan Avenue  
San Carlos, California  
LYtell 1-0375

For more facts, use Request Card at page 18 and circle No. 327



#### Tough new tires for tractor shovel

New tires that combine the advantages of pneumatic and laminated tires are now available as optional new equipment or replacements on the Yale Y-18 tractor shovel.

Called "mine cushion tires," they reportedly last three to five times longer than pneumatic tires and reduce equipment wear and operator fatigue. The new tire is also said to eliminate unexpected tire failure and permit tire changing on a scheduled, off-hour basis.

Mine cushions are particularly suited to use in hazardous applications where shock-transmitting laminated tires have been standard due to inability of the pneumatic tire to withstand cutting and chipping.

For further information write to The Yale & Towne Mfg. Co., Materials Handling Division, Dept. C&E, 11,000 Roosevelt Blvd., Philadelphia 15, Pa., or use the Request Card at page 18. Circle No. 247.

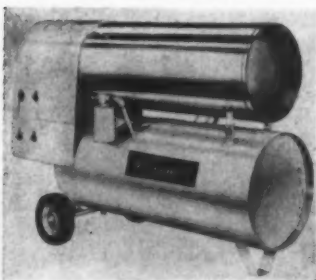
#### New heater features 80,000-Btu capacity

The White Mfg. Co. announces the addition of a new model to its line of heaters for use in construction work.

The Model H-2 has a capacity of 80,000 Btu per hour and features a 2-pass stainless-steel combustion chamber that eliminates objectionable odor and smoke.

A rugged 16-gage steel fuel tank operates this heater for 20 continuous hours and longer when thermostat-equipped, states the manufacturer. All parts are easily accessible for maintenance and repair.

For further information write to the White Mfg. Co., Inc., Dept. C&E, 1227 W. Beardsley Ave., Elkhart, Ind., or use the Request Card at page 18. Circle No. 13.

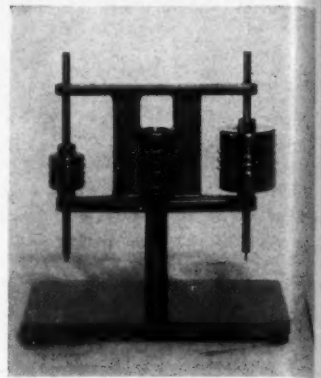


#### New apparatus available for testing cement set

Greater mechanical stability, for more accurate test results, has reportedly been built into a new design of the Gillmore apparatus for cement testing offered by Soiltest, Inc.

The apparatus determines the time of set of cement by determining at what time test specimens will bear the point of a weighted needle. A ¼-pound needle determines the time of initial set, while another needle weighing 1 pound determines the time of final set.

For further information write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the card at page 18. Circle No. 248.



## NEW ML-309 LOADER IS 'WAY OUT FRONT



ML-309 Moto-Loader—18,000 lb. lift capacity, equipped with 3 cu. yd. bucket.

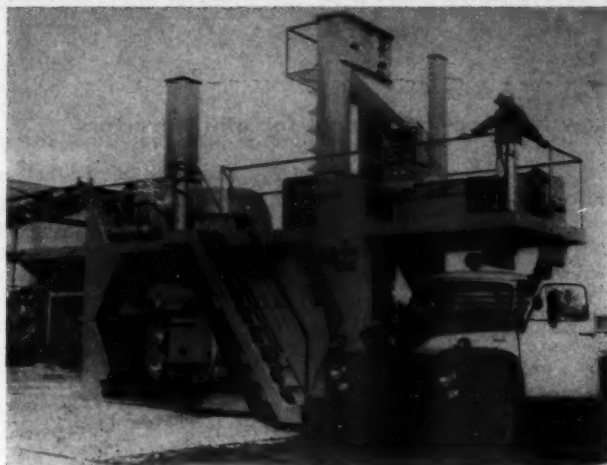
### New Moto-Loader has greater reach . . . greater dump height than any machine in its class

Maximum dump height of 10' and a forward reach at maximum dump height of 3'6" puts the new Lorain ML-309 'way out front of all the other loaders in its class, in these important ranges. And, it is here, where the work is done, that the "309" pays off, lets you load the biggest, highest trucks fast and efficiently for maximum profit.

The "309" is 'way out front too in Lorain's 3-way

balance—of power, weight, and control—for smooth fast cycles. And it's 'way out front in a long list of design and construction features that owner and operator alike recognize as making it easier for them to get the job done.

See your Lorain Moto-Loader distributor for the facts and an on-the-job demonstration. Then "309" will be 'way out front with you too.



Because of the compactness and ease in moving the Wylie 3140, the plant can economically handle a wide variety of small jobs.

#### Portable asphalt plant is self-contained unit

The Roadmaster Model 3140 asphalt plant, a self-contained unit with an output of 30 to 40 tph of hot-mix and up to 50 tph of cold-mix, is announced by the Wylie Mfg. Co.

Built to operate upon its own base, with no need for concrete piers, the unit is completely automatic.

The manufacturer points out that the unit's 8-foot over-all width and the laydown features of the upper section of the elevator eliminate many moving problems.

Direct charging of aggregate from material hopper into the dryer eliminates a cold-material elevator and possible clogging of chutes. The dryer combustion chamber and burners pivot away from the end of the dryer, making the interior of the dryer, elevator boot, and combustion chamber readily accessible.

For further information write to the Wylie Mfg. Co., Inc., Dept. C&E, P. O. Box 7086, Oklahoma City, Okla., or use the Request Card at page 18. Circle No. 241.

**'WAY OUT FRONT IN CONTROLS**—"No-hands" direction control frees operator's hands at all times for steering and other operations. Operator just moves his left foot from one to the other of two adjacent pedals to move the ML-309 forward or backward and to control speed of travel.

**'WAY OUT FRONT IN SAFETY**—New "safety" arms give operator better all-round vision at all times . . . protect him against hazardous "scissors" action. The exclusive "S" shaped arms absorb digging shocks and deflections, provide maximum ranges.

**'WAY OUT FRONT IN BUCKET ACTION**—New bucket design assures full loads even in the back corners. The load crown is near the center for dribble-free carrying. Bucket is made of heavy Cor-Ten steel, with a long, extra thick, wrap-around lip with a double cutting edge.

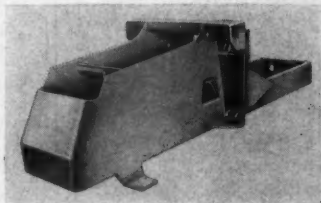
**'WAY OUT FRONT WITH 4-SPEED MOTO-MATIC**—Quick shifting at full power . . . starting and accelerating heavy loads—it's easy with the "309's" torque converter and 4-speed, full power shift Moto-Matic transmission. Automatic de-clutch permits "inching" the load.

**'WAY OUT FRONT IN EASY STEERING**—Power steering means easier maneuvering . . . less tiresome, time-consuming jockeying. Twin hydraulic power booster cylinders give smoother control, better roadability at high speeds. Automatic, stand-by mechanical steering controls are also provided.

**'WAY OUT FRONT IN TRACTION**—High traction differential axles deliver 4-wheel planetary drive. Steering rear axle is saddle-mounted for 23° of vertical articulation, assures positive traction. For highway travel, this axle may be de-clutched for 2-wheel drive.

**'WAY OUT FRONT IN STRENGTH**—Heavy-duty one-piece frame withstands impact shocks, stresses and strains. This rugged one-piece weldment of heavy steel plate holds all machine components in alignment. The most rugged going can't deflect, twist or knock out the ML-309.

THE THEW SHOVEL COMPANY, LORAIN, OHIO



*Adulterate!  
Never!*  
Adulterate:  
To make impure  
by admixture of other  
or baser ingredients;  
corrupt.

Our Sta 'N Play gal and her roommates don't believe in it.

Sta-Crete ships an unadulterated Epoxy formulation to meet your job requirements—from a playground for Sherman tanks to a playground for Playboys.

Of course, we're partial to Architects, Engineers and Contractors who are all part-time Playboys.



Let's start dating now—

My Sta 'N Play Datebook is reserved for you.

STA-CRETE Inc.,  
115 New Montgomery,  
San Francisco 5, California

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_  
Position \_\_\_\_\_  
Company \_\_\_\_\_  
Phone \_\_\_\_\_

Dealer Inquiries Invited.

For more facts, use coupon or circle No. 329

# LORAIN®

## ON THE MOVE

PLANTS in Lorain, Elyria, and Bucyrus, Ohio.

PRODUCTS—Power shovels, cranes, draglines, clamshells, and hoes on crawlers from 3/4- to 2 1/2-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6000-lb. and 7000-lb. carrying capacity.

OUTLETS—Lorain products sold and serviced by 249 distributor outlets throughout the world.

For more facts, use Request Card at page 18 and circle No. 325

Available with buckets up to 36 inches wide, the Hydro-Clam Model 88C has a 3,000-pound lift capacity and a 12-foot digging depth.



### New backhoe attachment for utility tractors

The Parsons-Shawnee Hydro-Clam Model 88C, a new backhoe attachment for utility tractors designed specifically for spot excavations, has been announced by the Parsons Co.

The Hydro-Clam is available with 24, 30, and 36-inch-wide buckets, features 10,000-pound breakout, 3,000-pound lift capacity, 12-foot digging depth, and 9-foot 9-inch dumping height.

The Hydro-Clam bowls operate in-

dependently or together to produce smooth, clean sides and level floor, according to the manufacturer. Tremendous breakout pressure of clam bowls produces square corners.

The entire clam assembly can be attached to or detached from the boom in minutes.

For further information write to the Parsons Co., Dept. C&E, P. O. Box 431, Newton, Iowa, or use the Request Card at page 18. Circle No. 228.

**THE BIG BITE**

Hook an OWEN Clamshell Bucket to your crane and you're sure of superior performance and longer life. For OWEN Buckets have exclusive super-efficiency and long-lived features you won't find in ordinary clamshells.

For instance:

- Block and tackle type reeving
- One-piece head construction
- Recessed lips
- Single main shaft
- Riveted bowl assembly

For over half a century OWEN has been building clamshell buckets—tailored to meet the requirements of "men who move the earth the world over".

So team your crane to the bucket with the BIG BITE that's JUST RIGHT for every job!

Write today for the money-saving facts and figures.

**THAT'S JUST RIGHT!**

**OWEN**  
**BUCKET COMPANY**  
 BREAKWATER AVENUE • CLEVELAND 2, OHIO  
 BRANCH OFFICES: New York • Philadelphia • Chicago • Berkeley, California • Fort Lauderdale, Florida

For more facts, use Request Card at page 18 and circle No. 330



## "PRECISE POWER" FOR EVERY CONSTRUCTION JOB

The name Continental has real dollars-and-cents meaning for users of specialized power—and for dealers who sell Continental-powered equipment. Among the many reasons are the broad diversification of the Red Seal line—one or more engines with exactly the right characteristics for virtually every construction job—and the fact that after-the-sale service is making them first choice for an ever-widening list of jobs in the building industry—wherever power is required.



ESTABLISHED  
SERVICE  
FACILITIES

ALL OVER THE WORLD

For more facts, use Request Card at page 18 and circle No. 331

## ARPS Trench Devil MODEL L-12

CHALLENGES  
ALL  
COMPARISON!

- DIGS WIDER - DEEPER - FASTER THAN ANY KNOWN COMPETITION
- COSTS LESS TO BUY - OPERATE - MAINTAIN
- SPEEDS UP TO 1200 FT. PER HOUR

GET THE FACTS and complete specifications on the Trench Devil from this specially prepared brochure.



**ARPS**  
 CORPORATION  
 DEPT. CE  
 NEW HOLSTEIN, WIS.

- SELF PROPELLED
- POWER BOOM CONTROL
- REVERSIBLE DIRT CONVEYOR
- OTHER MODELS  
 MA-2 - Self Propelled. Slightly less capacity than L-12
- JR Trencher Economy Model, hand winch propelled

• TRENCHERS • HALF TRACKS • DOZERS • UTILITY BLADES

For more facts, use Request Card at page 18 and circle No. 332

CONTRACTORS AND ENGINEERS

### Add-3-yard-capacity unit to front-end loader line

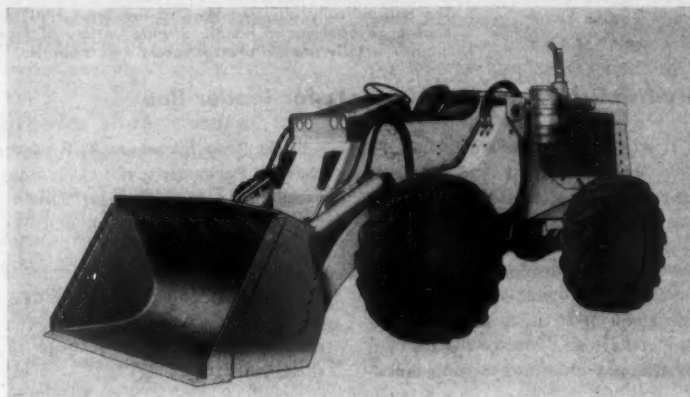
A front-end loader with a 3-yard, 9,000-pound carry capacity is announced by The Thew Shovel Co.

Designated Lorain Moto-Loader Model ML-309, this rubber-tire unit has a lifting capacity of 18,000 pounds. Other features include balanced design, the power and weight for good digging penetration, adequate hydraulic power for fast bucket rollback, and a new "fast fill" bucket design that in carry position holds the crown of the load to the back of

the bucket to prevent dribbling. One-foot control of forward and reverse travel and speed is also standard.

The machinery is powered by a Cummins diesel engine and has torque converter, planetary axles, power-shift transmission, power steering, and power brakes.

For further information write to The Thew Shovel Co., Dept. C&E, 28th and Fulton Road, Lorain, Ohio, or use the Request Card at page 18. Circle No. 237.



Featuring a 3-yard bucket and a lifting capacity of 18,000 pounds, the ML-309 is the third model to be introduced in Thew's Moto-Loader series of rubber-tire, 4-wheel-drive front-end loaders.



### HERE'S THE FIRST "COMPACT" ROLLER WITH PNEUMATIC TIRES

Big roller performance...  
Compact maneuverability with new  
**ROSCO AIR-PAC**

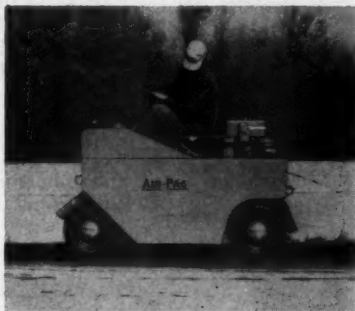
With its 36 inch rolling width and short 10 foot turning radius, AIR-PAC handles jobs big machines can't touch. Now you can have all the advantages of big roller performance with "compact" maneuverability. The kneading action of the oscillating wheels delivers full-size compacting action. **FEATURES:** Low tip-proof center of gravity and clear operator visibility—two built-in water tanks for spraybars. Two ton total working weight. Four oscillating wheels in front and five wheels at the rear. Working speeds from 0 to 3½ mph, forward or reverse with power to spare.

#### Use Air-Pac For...

- SHOULDER WIDENING
- PATCHING
- PARKING AREAS
- DRIVEWAYS
- APPROACHES
- WALKWAYS AND SIDEWALKS

Optional Equipment:  
cocoa mats and nite lights.

Rosco and Rolcor Division distributors are located everywhere in the United States and Canada. Consult one of them or contact the factory for more information.



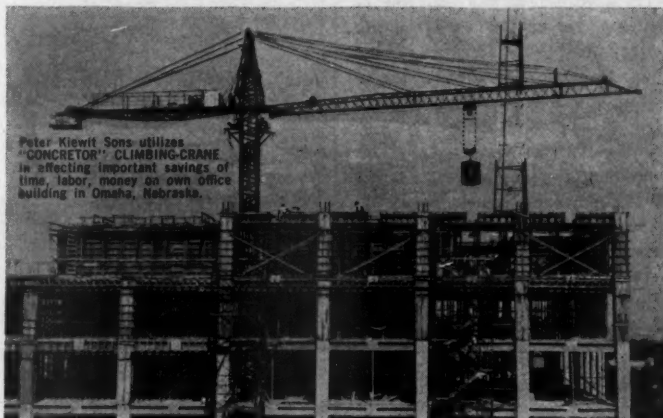
The low cost Air-Pac will pay for itself on shoulder widening jobs alone.

**ROSCO**  
MINNEAPOLIS

**ROSCO MANUFACTURING CO.**  
3110 SNELLING AVE. • MINNEAPOLIS 6, MINNESOTA

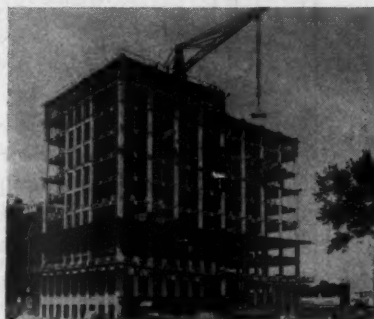
For more facts, use Request Card at page 18 and circle No. 333

### HOW "CONCRETOR" CLIMBING-CRANES REVERSE RISING CONSTRUCTION COSTS



The "CONCRETOR" CLIMBING-CRANE goes up with the building while work is in progress... 23 floors at a time... the sky's the limit. Climbs by its own hoisting winch on floors or inside elevator shafts.

"CONCRETOR" CLIMBING-CRANES quickly and efficiently place loads "on a dime"... up to 100 foot radius due to the 360 degree swing of its 100 foot jib. They eliminate the need for street access and expensive rehandling of materials over unnecessary ramps and runways, thus substantially lowering operating costs... while also serving to keep community relations on a pleasant, friendly level.



Scandinavian "CONCRETOR" CLIMBING-CRANES are recommended for all types of construction including industrial, apartment and office buildings, silos, water towers, bridges and viaducts. Perfect when slipped with "CONCRETOR" hydraulic slipform equipment.



Crane is remote-controlled by one man from working deck with 3½ lb. electronic panel. He is free to move to any part of the job, and to assist in loading and unloading.

**LOWER CAPITAL INVESTMENT!** "CONCRETOR" CLIMBING-CRANES cost about half of what you'd expect to pay for earth-bound cranes of similar capacity. Experience has shown that with ordinary use, the cost of a "CONCRETOR" CLIMBING-CRANE can be amortized over a period of about 2 years. **CHOICE OF 4 MODELS — RENTAL/PURCHASE PLANS.** Delivered anywhere in U.S. Factory-trained service engineers available.

Versatile combined climbing and traveling crane. Can be used on rails or in a fixed position.

#### B. M. HEED, INC.

30-01 37th Ave., Long Island City 1, N.Y.

B. M. HEED CALIFORNIA, INC.,  
630 Sixth Street, San Francisco 3, Cal.

DISTRIBUTOR FRANCHISES AVAILABLE in a few selected territories. Write Dept. CE-1 for details.

#### MAIL COUPON FOR LOW COST DETAILS AND FREE LITERATURE

B. M. Heede, Inc. 30-01 37 Ave., L. I. C. 1, N. Y.  
☐ Send me "CONCRETOR" CLIMBING-CRANE literature and price list.  
☐ I am interested in ☐ Buying ☐ Rental-Purchase  
 Company.....  
 Address.....  
 Town.....Zone.....State.....  
 My Name.....Title.....

For more facts, use coupon or Request Card at page 18 and circle No. 334

The hydraulically adjusted jaws of the Drott 4-in-1 bucket enable an operator to handle a wide variety of jobs that might normally require several specialized machines.

### Hydraulically adjusted buckets for loader line

Drott 4-in-1 buckets are now available for the largest and smallest models of the Hough 4-wheel-drive Payloader line.

With the development of a 4-cubic-yard 4-in-1 bucket for the big H-120 model and a 1-cubic-yard bucket for the small H-30 unit, the complete line of Payloader tractor shovels can be equipped with these versatile units.

These Drott buckets make it possible for a Payloader to do: (1) normal excavating and loading, (2) bulldozing, (3) clamshell pickup, and (4) scraping and grading.

For further information write to The Frank G. Hough Co., Dept. C&E, 710 Seventh Ave., Libertyville, Ill., or use the Request Card at page 18. Circle No. 219.



### Offer midget vibrator with heads to 2 inches

The Stow Mfg. Co. offers a light-weight, heavy-duty small electric vibrator designated Model EU.

Powered by a rugged 1-hp motor, the unit is available with  $\frac{1}{8}$ ,  $1\frac{1}{4}$ , 1%, or 2-inch vibrator heads. All of these heads have duplex ball bearings at each end to support the eccentric weight, and are sealed to retain the oil lubricant for life. Flexible shafts are available in lengths of 2 to 21 feet.

The EU is especially suited for jobs where narrow forms are used and where reinforcement is closely spaced.

For further information write to the Stow Mfg. Co., Dept. C&E, 40 Shear St., Binghamton, N. Y., or use the Request Card at page 18. Circle No. 12.

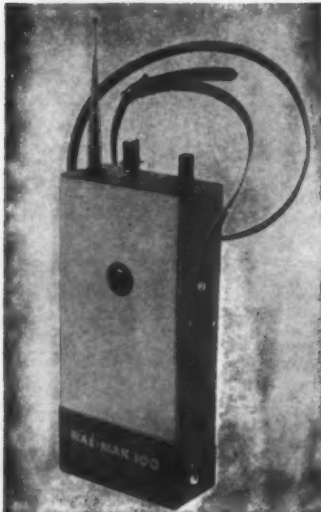
### New two-way radio fully transistorized

Rae-Mar Electronics, Inc., announces a new, fully transistorized 2-way radio known as the Transceiver Model 100.

Normal range is up to one mile, and this can be greatly increased when used to supplement a 5-watt citizens-band system.

The Rae-Mar 100 Transceiver features 7 transistors and a large 3-inch speaker-mike. It can be operated up to 50 hours on a 9-volt rechargeable battery.

For further information write to Rae-Mar Electronics, Inc., Dept. C&E, 1917 N. Hoyt Ave., South El Monte, Calif., or use the Request Card at page 18. Circle No. 227.



Kaser's Barber-Greene 828 Stabilization Plant is shown in a quarry near Dexter, Ia. The 828 hydraulically erects itself in just two minutes after being towed to the job site. Heavy duty

Barber-Greene portable conveyor and special 36" reciprocating feeder and trap complete the installation.

## STABILIZATION MIXER ERECTS IN TWO MINUTES, TOPS 600

**Barber-Greene self-erecting, portable plant gives Iowan low cost output; his two Barber-Greene asphalt plants combine to produce 1,000,000 tons of hot mix.**

Don Kaser of Des Moines wears two hats: 1) spokesman for high type asphalt paving as a founder and past president of the Iowa Asphalt Paving Assn.; and 2) producer of high type asphalt paving and base mixes as head of Kaser Construction Co.

He's a user of Barber-Greene asphalt paving equipment since 1954 when he bought his first 848 Continuous Mix asphalt plant. Two years

later he added a second 848 plant. Since that time these plants have combined to produce 1,000,000 tons of high quality, low cost mix.

Kaser Construction purchased their new Barber-Greene Model 828 Self-Erecting, Portable Stabilization Plant in 1959, and Don Kaser reports, "production was 130,000 tons the first year and we expect to mix 200,000 tons this year. "We average 500 tph, but top 600 tph during peak periods. The 828 gives us control to meet specs easily and capacity to keep up with as many trucks as the contractor can provide. These features plus 2-minute hydraulic plant erection and complete portability let us handle jobs more economically than when we mixed and spread



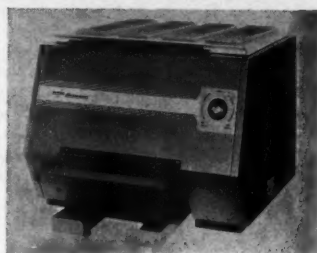
This 848 Barber-Greene Continuous Mix plant is producing Hot Mix Type A for the Kaser firm on a \$1,000,000 contract at New Sharon, Ia. Both plants operate at a peak of 250 tph and require an average of four days to move — smoke to smoke.

### Desk-top photocopier is completely automatic

The American Photocopy Equipment Co. offers the Electro-Stat desk-top copier featuring an electrophotographic technique.

No liquids are used in this compact, completely automatic unit, said to produce five copies per minute.

Modular construction permits quick service, and individual components may be removed and replaced without dismantling the machine. The Electro-Stat plugs into any convenient



20-amp 110-volt outlet.

For further information write to the American Photocopy Equipment

Co., Dept. C&E, 2100 W. Dempster St., Evanston, Ill., or use the Request Card at page 18. Circle No. 14.

### Grouser shoe features more impact resistance

A grouser shoe said to withstand exceptionally severe impacts without damage from breaking or bending is available from the WesTrac Co.

The shoe, rolled of special alloy steel, is completely interchangeable with the original equipment, and may be used in complete groups with any

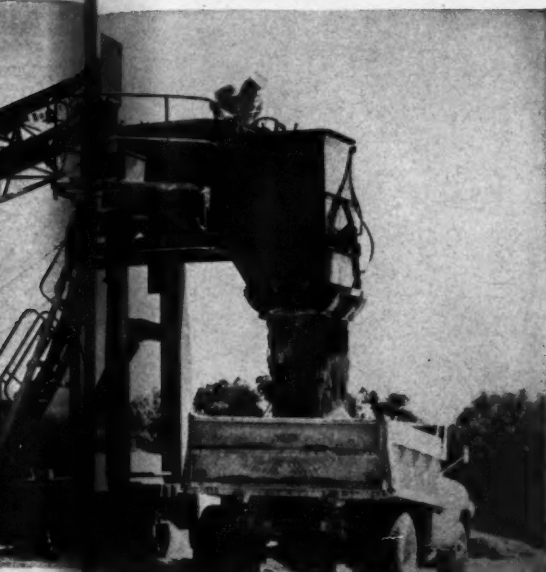
interchangeable grouser shoes.

For further information write to the WesTrac Co., Dept. C&E, Dept. G., 1309 W. Sepulveda Blvd., Torrance, Calif., or use the Request Card at page 18. Circle No. 21.

### Snowplow attachment for excavating machine

A snowplow that does not require extra casting wings is offered by Balderson, Inc., for the Cat 966 Traxcavator. Known as Model BV966, the unit is said to be easily attached in place of the Traxcavator bucket.

For further information write to Balderson, Inc., Dept. C&E, Wamego, Kans., or use the Request Card at page 18. Circle No. 221.



Model 828 Self-Erecting Stabilization Mixer shown in travel position.



#### EXCLUSIVE PUGMILL FEATURES

Material forms its own mixing chamber in pugmill, eliminating need for liner plates. Centrifugal water pump and precision water meter assure water content needed for proper compaction.

Twin shaft pugmill gives fast, thorough mixing. Hydraulically operated clamshell gate opens across full width of surge hopper, prevents segregation in discharging, allows operation between trucks. Enclosed gear box runs in oil bath. Paddle tips and paddle arms are reversible and replaceable. Diesel or electric power available.

" reciproc

## CTS OPS 300 TPH

Since that  
to produce  
mix.  
their new  
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Don Kaser  
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this year.  
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jobs more  
and spread

on the road bed with a grader. Now we get far better accuracy by central plant mixing, hauling to the site and putting in place with a spreader."

**Full Stabilization Plant Line**—This self-erecting Model 828 is but one of four units in Barber-Greene's No. 1 stabilization plant line that offers a production range from 200 to more than 600 tph. The big 828 is also available in portable and stationary models. The smaller Model 824 produces from 80 to over 200 tph. All models are backed by unmatched experience in continuous material handling and control—your assurance of highest tonnage at lowest cost. See your Barber-Greene Distributor for the plant and the conveyor matched to your needs.



Only Barber-Greene offers four different finishers plus a Road Widener-Shoulder Paver—equipment sized for all your needs.

World's No. 1 Manufacturer of Asphalt Paving Equipment

Representatives in Principal Cities of the World

## Barber-Greene

Main Office and Plant AURORA, ILLINOIS, U.S.A.  
Plants in DeKalb, Illinois, Detroit, Canada, England, Brazil, Australia



## Now an IDEAL TOWER LIGHT for all conditions

A TYPICAL FIELD REPORT:  
"Ordinary floodlights in my towers burned out in ten days. STURDILITES have been burning 10 hours a day for 12 weeks without a failure, despite 200-mile moves. Light distribution is also vastly improved."

(Signed by the owner of a prominent South Dakota construction firm)



- 10 to 100 times longer bulb life
- Controlled illumination
- Exclusive synchro-harmonic shock suppression

PATENT PENDING

**Super Rough Service**

## STURDILITE

Buying too many bulbs for your towers? Getting poor light distribution? Chances are your towers are vibrating. This, together with moving shocks, reduces illumination and shortens bulb life. New, Super Rough Service STURDILITE is ideal for such conditions. It is, however, only one of many types in the Phoenix line available in a wide range of beam patterns, voltages and wattages not only for towers but for all types of construction equipment. You can get exactly the kind of lighting you want. And it will cost you less to use. There's a right and wrong light for every tower application.

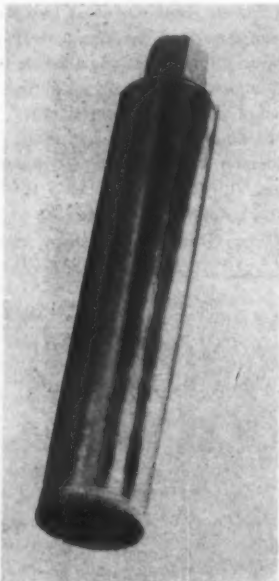
It's easy to make sure. Our 30-year, heavy-duty lighting experience is at your disposal. No obligation. Literature on request.



**PHOENIX PRODUCTS COMPANY**  
4727 N. 27th Street • Milwaukee 9, Wis.

### Diamond core drill cuts like hole saw

The Timesaver Tools Co. offers a new diamond masonry core drill. Designed specifically for construction drilling, these drills operate on the principle of a hole saw and are used for cutting clean, round holes in many types of masonry materials including steel-reinforced concrete.



The top end of the drill has a built-in hexagonal hub that is threaded to fit directly on the drilling rig without need for an expansion adapter. The drills are built to fit all standard wet-cutting drilling rigs.

Standard drills are 14 inches long and are available in sizes from 1 inch through 6 inches in diameter.

For further information write to the Timesaver Tools Co., Dept. C&E, 5130 Richmond Road, Bedford Heights, Ohio, or use the Request Card at page 18. Circle No. 236.

### Motor grader travels at speeds to 23.6 mph

The LeTourneau-Westinghouse Co. announces a new motor grader, the Model 330-H.

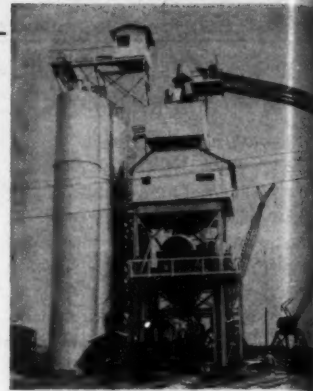
This is a 100-hp unit, with the choice of power from either a GM 3-71 or a Cummins V-6-BI engine.

The Model 330-H uses 9.00 x 24 front and 13.00 x 24 rear tires as standard. Front axle clearance is 25 inches. A heavy-duty constant-mesh transmission with eight forward speeds up to 23.6 mph is standard. Creeper gears are available as low as 1/4 mph. The four reverse speeds range from 1.7 to 12.2 mph. Weights, with standard equipment, are 21,690 pounds with the GM engine, and 22,090 pounds with the Cummins.

The engine is rubber-mounted to eliminate vibration to the frame. A wide range of optional equipment and accessories is available.

For further information write to the LeTourneau-Westinghouse Co., Dept. C&E, 2301 N.E. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 53.

Push-button batching and mixing are features of the 200-cubic-yard-per-hour concrete-producing operation of the Duke Power Co. for construction of the Cowans-Ford Dam near Charlotte, N. C. Nine individual weigh batchers and three tilting mixtures are operated automatically from a Noble console on the batching deck. The plant operates 8 hours per day on this 350,000-cubic-yard job scheduled for completion in early 1963. Designed on the stack-up principle, the plant was erected in two weeks. For further information write to the Noble Co., Dept. C&E, 1860 Seventh St., Oakland, Calif., or use the Request Card at page 18. Circle No. 11.



## B.F. Goodrich helps unlock Ohio River traffic jam

**WITH TIRES, HOSE AND OTHER PRODUCTS, B.F. GOODRICH SPEEDS CONSTRUCTION OF NEW NAVIGATION SYSTEM**

Time was when traffic was slowed by 4 separate locks in a 95-mile stretch of the Ohio River. But the Capt. Anthony Meldahl Locks and Dam will flood them. This project is part of a modern navigation system that will

reduce 13 locks and dams to 3, and lockage time from 19 1/2 hours to 1 1/2 hours.

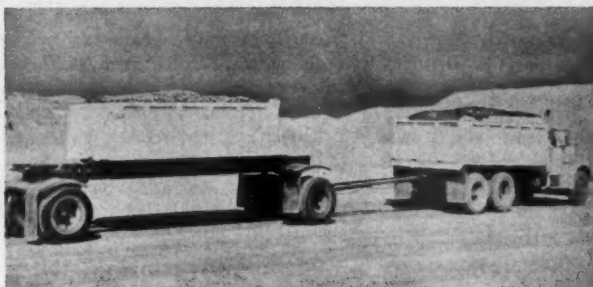
Groves Ventures Company of Minneapolis, Minnesota, a joint venture sponsored by S. J. Groves & Sons Co. is on the job with an army of B.F. Goodrich tires and always-available BFG tire service. Rock Service tires, for example, haul 33-ton loads of concrete from batch plant to lock forms over rock-strewn roads. No problem for these BFG giants, though. They're available in new

### Transfer trailer pulled by dumper

Challenge-Cook Bros., Inc., announces its new, improved hydraulic-powered transfer trailer.

This trailer is designed to work with any standard 10-wheel dump truck. Truck and trailer have a combined legal payload in excess of 26 tons.

For further information write to the Challenge-Cook Bros., Inc., Dept. C&E, 3334 San Fernando Road, Los Angeles 65, Calif., or use the Request Card at page 18. Circle No. 26.



One dump truck and one operator teamed with a Challenge-Cook Bros. transfer trailer is able to haul and dump two loads instead of one.

**33 TONS OF CONCRETE** leave batch plant (photo at left) bound for lock pouring area (below). Locks will be 110' x 1200', will require over 670-thousand cubic yards of concrete, will cost over \$25-million. B.F. Goodrich Rock Service and Rock Rib tires haul concrete 16 hours a day, 6 days a week down 2 long grades into the cofferdam excavation. Roads are covered with crushed rock and gravel, and often with 6" of water. Yet BFG tires give exceptional service, Groves Ventures reports.



**B.F. GOODRICH ON-THE-JOB TIRE SERVICE** keeps Groves Ventures equipment rolling on lock project near Chilo, Ohio—keeps tire costs at a minimum. The BFG Servicemobile and repair shop are manned by tire experts, whose workmanship prompts Project Manager W. J. Green to write, "B.F. Goodrich service and repair facilities have done an excellent job of covering our needs."

**NO STING IN THIS STEAM HOSE**, used to cure concrete at Capt. Anthony Meldahl locks. It's Burstproof hose, made of BFG-developed heat-resistant rubber with layers of braided wire reinforcement. It can't explode. Supplying Groves Ventures with hose, belting and protective clothing—as well as tires—is all part of the BFG Unified Contractor Program. Contractors benefit from lower costs and better rubber products' service with this new BFG program.



Cut Protected compound that defies tire-killing rock. B.F. Goodrich Flex-Rite Nylon cord construction withstands double the impact of ordinary materials, resists heat blowouts and flex breaks. Result: more retreadable tires. No wonder Groves Ventures specifies BFG tires.

You'll find B.F. Goodrich hose, protective clothing and other products at work here—all part of the BFG Unified Contractor Program that helps contractors cut costs and get better service from rubber products. Call your nearby B.F. Goodrich Smilage dealer (listed under Tires in the Yellow Pages). He has the know-how to help make your next contract more profitable. The B.F. Goodrich Company, Akron 18, Ohio.

**Specify B.F. Goodrich Tubeless or tube-type tires when ordering new equipment**

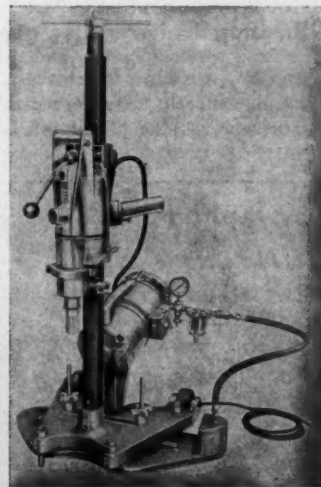


For more facts, use Request Card at page 18 and circle No. 337.

### Vacuum pad anchors portable drill rigs

A widely adaptable vacuum pad, which instantly anchors portable drilling machines on jobs where other forms of anchoring are either impractical or undesirable, has been announced by the Wheel Trueing Tool Co.

The unit, named Truco Tru-Vac, is an accessory that can be used with Truco portable diamond drilling machines, as well as with others.



chines, as well as with others.

According to the manufacturer, the device permits the drilling machine to be set up with the base parallel to the work or, if desired, horizontal while drilling on an incline.

The unit consists of a flat aluminum pad resting in a molded rubber gasket that seals it to a floor or wall surface when vacuum is applied. Vacuum is developed by means of an electric motor and pump unit that plugs into any standard circuit. A pressure gage and dust-collector cup are included.

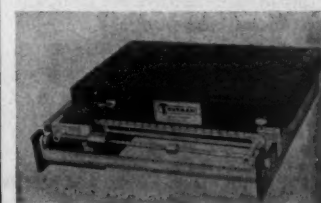
For further information write to the Wheel Trueing Tool Co., Dept. C&E, 3200 W. Davison Ave., Detroit, Mich., or use the Request Card at page 18. Circle No. 233.

### Scale of 10-ton capacity for on-the-spot weighing

The Thurman Scale Co. announces a compact, lightweight Wheeload portable weighing scale specifically designed for on-the-spot weighing.

The unit, which has an 18-inch-long, 12-inch-wide platform, weighs only 70 pounds, yet will handle loads up to 20,000 pounds. The weigh beam is graduated in 10-pound minimum increments and is easily balanced.

For further information write to the Thurman Scale Co., Dept. C&E, 1939 Refugee Road, Columbus, Ohio, or use the Request Card at page 18. Circle No. 217.





Designed to give a compaction effect of up to 30 tons, the 7,400-pound VA3 operates at speeds up to 2 mph.

### Vibrating trailer roller gives 30 tons compaction

The VA3 vibrating trailer roller, featuring twin rolls and independent rotation and vibration of each roll, is

announced by Zettelmeyer.

The roller weighs 7,400 pounds and has a compaction effect of up to 30 tons. The vibration frequency, which is adjustable, is provided by an air-cooled diesel engine at varying frequencies in the range of 1,590 to 2,800 vibrations per minute.

The unit has a rolling width of 82 inches; the rolls have a diameter of 47 inches. Total length of the roller is 147 inches, and it is intended for rolling speeds of 1/2 to 2 mph.

Due to the design of the twin rolls and their independent suspension, the roller can be turned in small circles without disturbing the surface of

the material being compacted. The vibrator is automatically engaged by an automatic clutch when the engine speed exceeds 1,200 rpm.

For further information write to Zettelmeyer, Dept. C&E, Suite 2509, 10 E. 40th St., New York 16, N. Y., or use the Request Card at page 18. Circle No. 15.

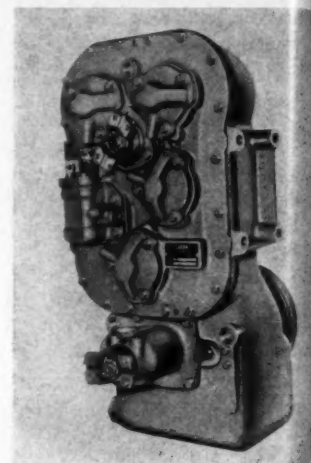
### Power-shift transmission for off-highway vehicles

A new power-shift transmission for off-highway vehicles is announced by the Clark Equipment Co.

Designated Series 2000, the new transmission is designed for use with the Clark 270 Series torque converter. It is designed for gasoline or diesel engines of approximately 200 pound-feet of torque output.

The major feature of the design is a system of four hydraulic clutches. These make available two speeds forward and two reverse, fully power shifted. A manual range selector is used, providing for four speeds in each direction. Reduction ratios are 4.78 and 2.53 in the two lower gears and 1.31 and 0.69 in the higher gears.

The transmission is lubricated by the torque-converter oil and serves as

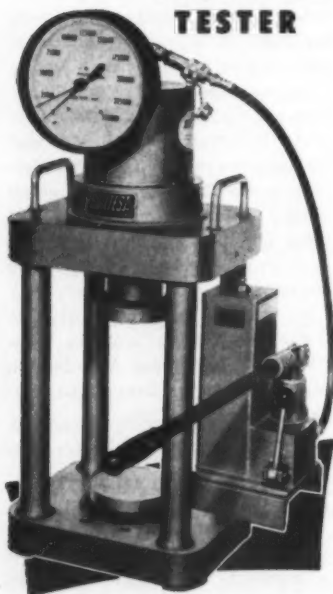


the sump for the converter. Hydraulic power to operate the clutches is supplied by a pump mounted on the torque converter. Two more pumps may be mounted on the converter to provide hydraulic power for auxiliary operations.

For further information write to the Clark Equipment Co., Automotive Division, Dept. C&E, Jackson, Mich., or use the Request Card that is bound in at page 18 of this issue. Circle No. 45.

## SOILTEST ENGINEERING TEST APPARATUS NEW, LOW PRICED CT-710

### CONCRETE TESTER



250,000 POUNDS CAPACITY FOR TESTING CONCRETE CUBES, BLOCKS, BEAMS AND CYLINDERS.

**ACCURATE  
PORTABLE  
COMPACT**

**SIMPLE TO OPERATE:** Loads are quickly attained by easy hand operation. The applied loads are shown on a large diameter dial gauge.

PRICE \$580.00 F.O.B. CHICAGO

**SOILTEST**  
Incorporated

4711 W. NORTH AVENUE • CHICAGO 38, ILLINOIS  
For more facts, circle No. 338



## TAKE THE "PRESSURE" OFF YOUR AIR COMPRESSOR PROBLEMS...

Take "Hardrock Smitty's" advice  
and **GO SMITH!**

The Smith 125 Air Compressor delivers over 125 cfm day in and day out. Rugged construction, smooth performance built into the Smith 125 means efficient, economical operation.

### The Smith 125 has the most wanted features:

- low initial cost
- low operating cost
- easy maintenance
- simple compact design
- 12 volt electrical system
- 125 cfm at 1165 RPM
- availability of parts

Compare price . . . compare job results—you'll Go Smith!

Ask your dealer for an "on the job" demonstration.  
(Write us for complete information and the name of your nearest dealer.)

# SMITH AIR COMPRESSORS

GORDON SMITH & COMPANY, INC., Bowling Green, Ky.

For more facts, use Request Card at page 18 and circle No. 339

## MICO

**HYDRAULIC PARKING  
LEVER LOCK**

Simply raise the lever, step on the pedal and the biggest truck, the heaviest load is **SAFE!**

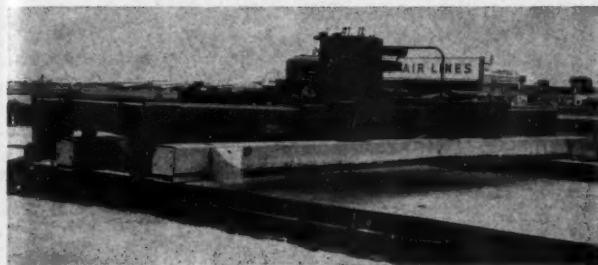
**WILL NOT INTERFERE WITH A NORMAL  
BRAKING OPERATION SIMPLE TO INSTALL**

Write for information on all MICO Brake Products

**MINNESOTA AUTOMOTIVE, INC.**  
1101 NORTH FRONT ST. MANKATO, MINNESOTA

For more facts, use Request Card at page 18 and circle No. 340

CONTRACTORS AND ENGINEERS



On Blaw-Knox's new self-widening concrete finisher, wheels are moved from inside to outside hubs for widening from 15 to 31 feet.

#### New concrete finisher is self-widening unit

A new self-widening concrete finisher—designed for road and airport paving but said to be versatile enough for many other construction operations, including structure paving—has been introduced by the Blaw-Knox Co.

On this auto-electric-powered unit, operator control is simplified by means of centrally located electric push buttons and hydraulic operating levels. Open grating on the floor of the machine affords good visibility of all paving operations.

The unit is power self-widening through a full range of 12 to 28 feet without frame alteration, in an infinite range of increments, and auto-

matically positions without additional clamping. Wheels are moved from inside to outside hubs for widening from 15 to 31 feet.

Heavy-duty box-type members used in the finisher's frame telescope into each other to effect changes in width.

Various screed arrangements are available in both crown-bolt and quick-adjustable types. Screed speeds are infinitely variable between 40 to 105 strokes per minute, and are independently controlled from traction.

Infinite traction speeds between 8 and 80 fpm are accomplished through 4-wheel-drive, powered by heavy-duty high-torque variable-frequency ac motors and gear reducers in each

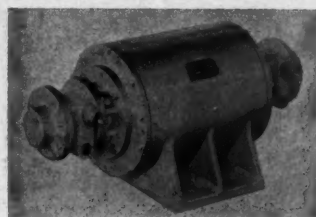
end truck. Power for the motors is provided by a variable-speed alternator, driven by an air-cooled 4-cylinder gasoline engine.

For further information write to the Blaw-Knox Co., Construction Equipment Division, Dept. C&E, Mattoon, Ill., or use the Request Card at page 18. Circle No. 216.

#### Heavy-duty vibrator gives 12 tons of force

A new vibrator is offered by the Martin Engineering Co.

Designated Vibrolator Model DVP-24,000, and weighing 231 pounds, this unit is said to develop 12 tons of unbalanced force at 3,000 vpm.



The unit may be equipped with pneumatic or hydraulic drive. Frequency may be steplessly controlled from 0 to 3,000 vpm by regulating the flow of air or oil.

For further information write to the Martin Engineering Co., Dept. C&E, Neponset, Ill., or use the Request Card at page 18. Circle No. 57.

## "NEW BROOM SWEEPS CLEAN"

on street or highway



### STANDARD STEEL

ENGINE and TRACTION  
DRIVEN CONSTRUCTION  
BROOMS

#### Check these features:

- Two way, 15° and 30° brush positions.
- Up to 73" wide sweeping patch even at 30°.
- Easy acting screw type lifting device eliminates troublesome hydraulic systems.
- High position broom lock for traveling.
- Wear equalizer adjustments at each end of brush.
- Chain drive from counter shaft to brush shaft.
- Traction model has 2 speed transmission.
- Engine model has 15 HP VE-4 Wisconsin power.

Write us or see your dealer for complete details.

OTHER PRODUCTS OF STANDARD STEEL  
ASPHALT DISTRIBUTORS . . . BURNERS . . . POWER AND TRAC-  
TION DRIVEN CONSTRUCTION BROOMS . . . MAINTENANCE  
DISTRIBUTORS . . . TAR KETTLES . . . AGGREGATE SPREADERS  
STREET FLUSHERS . . . PIPE LINE EQUIPMENT . . . SUPPLY TANKS  
SHELVE HARDWARE . . . AND AGRICULTURAL EQUIPMENT

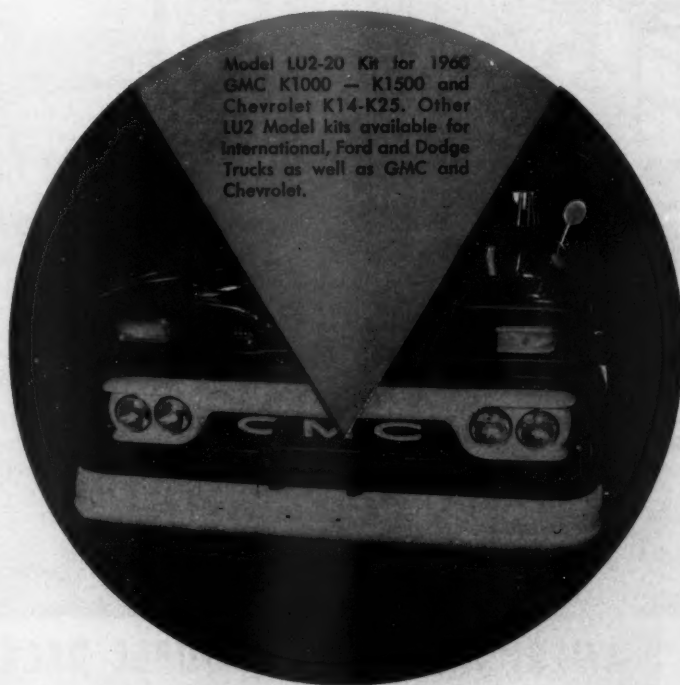


Standard Steel Works, Inc. NORTH KANSAS CITY, MO. BR 1-57

For more facts, use Request Card at page 18 and circle No. 341

## A BRADEN Winch with

# Versatility Plus!

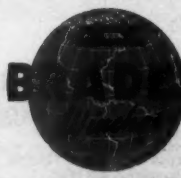


Model LU2-20 Kit for 1960  
GMC K1000 — K1500 and  
Chevrolet K14-K25. Other  
LU2 Model kits available for  
International, Ford and Dodge  
Trucks as well as GMC and  
Chevrolet.

This lightweight, front end model is the sturdiest winch of its type ever developed. Top quality workmanship and finest materials, the same as found in heavier models, make the LU2 series a "workhorse" that will give years of dependable service.

This model is perfect for lifting, towing and pulling jobs that need careful handling. It has a safe working load of 8,000 pounds, and is designed for easy installation.

Write for complete information.



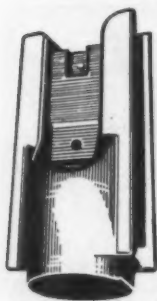
**BRADEN WINCH** DIVISION OF MOTOR  
PRODUCTS CORPORATION

P. O. BOX 547 • BROKEN ARROW, OKLAHOMA

"In Service Around the World"

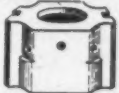
For more facts, use Request Card at page 18 and circle No. 342

## DEPENDABLE SEMI-STEEL PILE HAMMERS



### PILE DRIVER HAMMERS

Well designed of tough close grained semi-steel to give maximum impact for easy reeving. Can be adapted to fit present leads. Fast service in sizes 2000 lbs. to 4000 lbs. in 250 lb. increments.



### FOLLOW BLOCKS

Sturdy semi-steel. Quick delivery on all sizes for hammers weighing 2000 lbs. to 4000 lbs.

### SWINGING LEADS One Section All-Steel

Lengths 20' 25' 30' 35' 40'

Maintain your pile drivers at top efficiency with this low cost replacement equipment.

Buy Direct  
From Manufacturer  
and

**Save!**

WRITE NOW . . .  
for detailed literature and  
low factory prices on other  
Paving Contractor Equipment!



**Sioux City Foundry & Boiler Co.**

East 8th & Division SIOUX CITY 2, IOWA Phone 5-7967  
For more facts, use Request Card at page 18 and circle No. 343

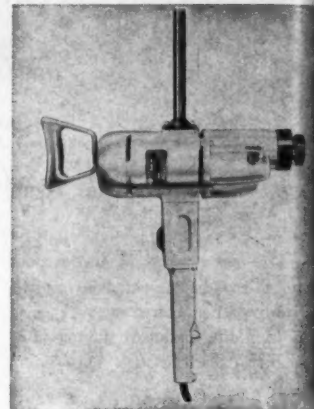
**Product Parade**—THESE PRODUCTS CAN HELP WIDEN YOUR PROFIT MARGIN

### Heavy-duty drill is reversible unit

To permit a wide variety of operations with one power unit, The Black & Decker Mfg. Co. offers a new 1 1/4-inch heavy-duty ball-bearing drill equipped with synchro-mesh transmission. This is designed to instantly change the spindle speed of this unit—even while the tool is operating—from 500 to 250 rpm no-load speed.

The 2-speed feature is useful in many operations including the drilling of holes from 1/2 inch up to 1 1/4 inches. The higher speed used with a smaller drill bit provides correct and practical speed for pilot holes, after which a larger bit is inserted and used at the lower speed.

The drill is also equipped with a reversing switch and has full power in either forward or reverse operation.



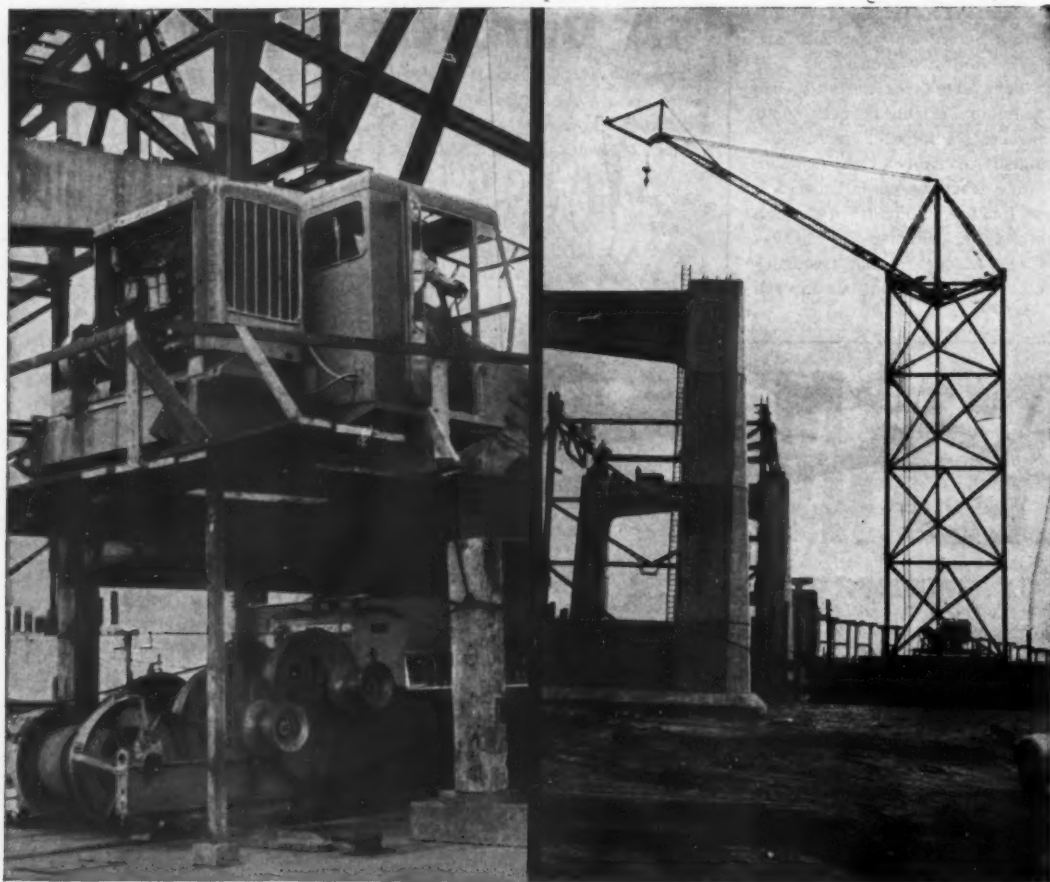
For further information write to The Black & Decker Mfg. Co., Dept. C&E, E. Pennsylvania Ave., Towson 4, Md., or use the Request Card at page 18. Circle No. 174.

### New 30-ton scraper has electric-powered wheels

An electric-wheel-powered scraper with a capacity rating of 30 tons has been added to its Pacemaker line by R. G. LeTourneau, Inc.

By virtue of a 420-hp diesel-electric power plant and driving wheels both forward and rear, the Series L-28 is a self-loading scraper in many types of material.

A major feature is "shuttle" operation between borrow and fill, according to the company. In this type of operation, the machine never turns around. It moves forward to dig, haul, and dump; moves back to get into digging position again. Electric-wheel



## AMERICAN BRIDGE DOUBLE DECKS CLYDE HOISTS ON BARGE MOUNTED TOWER DERRICK

**T**he two Clyde Hoists used by American Bridge Division of U.S. Steel Corp. were years apart in manufacture. In age and appearance they were very different. But in the important measurements of hoist value they are identical twins.

Both Clyde Hoists were carefully engineered, trademarked by integrity of manufacture and performance that equaled or exceeded claim or promise. Both were carefully designed and ruggedly constructed to lower material handling costs with greatest possible safety; to require minimum maintenance and to offer maximum accessibility for servicing.

Clyde has been building good hoists . . . the best hoists . . . for more than seventy-five years.

Write for Bulletin 34A for specifications  
on the complete line of Clyde Hoists

**CLYDE IRON WORKS, Inc.**



Established 1899  
DULUTH 1, MINNESOTA

HOISTS : DERRICKS : WHIRLEYS : BUILDERS TOWERS  
UNLOADERS : CAR PULLERS : ROLLERS

For more facts, use Request Card at page 18 and circle No. 344



American Bridge Division, United States Steel Corporation has a 165 foot, barge-mounted tower derrick to set steel on the center span of the new high bridge at Duluth-Superior, western terminal of the St. Lawrence Seaway. Two Clyde Hoists were used, one to operate the derrick and one to position the barge.

## 2 General PORTABLE DRILLS

Built for  
**Faster . . . Easier Digging!**



### NEW MODEL 32

Designed for tough, heavy duty production with less operator effort, greater handling ease and efficiency. Takes all augers up to 12" diameter.

### TWO MAN DRILL

Weights less than 50 lbs. complete with auger. Powerful 4 1/2 hp air cooled engine. Positive safety clutch and finger-tip throttle control.

### MODEL 24B

The original, Portable Power Drill! Digs a true, clean hole, 2 1/4 ft. deep in less than 30 seconds! Easily adaptable to any drilling job in earth, wood or ice. Weighs 29 lbs. (less bit). Powered by a 2 1/2 hp air cooled engine. Positive safety clutch and finger-tip throttle control.

**INTERCHANGEABLE** Auger Bits and Shaft Extensions available for both models. Augers available from 2" to 12" diam.

**GENERAL EQUIPMENT CO.**  
OWATONNA 1, MINNESOTA

For more facts, circle No. 345

**CONTRACTORS AND ENGINEERS**



drive offers the same power and speed in either direction, and the 2-axle suspension with all-wheel drive reportedly makes forward or reverse steering equally easy.

To facilitate this type of operation, the L-28 is equipped with a rotating seat and control panel. Instead of turning the machine, the operator merely turns as he would in a swivel chair. A small control panel remains in front of him at all times.

For further information write to R. G. LeTourneau, Inc., Dept. C&E, 2309 S. MacArthur, Longview, Texas, or use the Request Card at page 18. Circle No. 244.

#### Offer high-lift block with 24-inch sheave

The Miller Swivel Products Co., Inc., announces a 24-inch-sheave-size high-lift block, that is available in single, double, triple, and quadruple sheaves, with 35 to 150-ton capacities.

For further information write to the Miller Swivel Products Co., Inc., Dept. C&E, P. O. Box 938, Pomona, Calif., or use the Request Card that is bound in at page 18 of this issue. Circle No. 245.

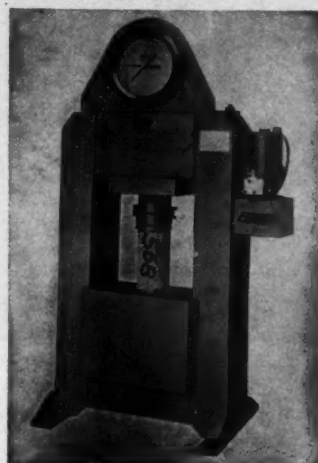
#### Power-operated tester

Forney's, Inc., announces the Model QC-225-PC compression machine of 400,000-pound capacity.

This unit is completely power-operated, and the usual manually operated pump is eliminated. Featuring the new power-control unit, the pump is said to permit very rapid traverse for fast pre-loading, as well as a precise adjustment of the rate of loading.

Accessory platens are available for testing masonry units up to, and including, 12 x 8 x 18-inch sizes.

For further information write to Forney's, Inc., Tester Division, Dept. C&E, P. O. Box 310, New Castle, Pa., or use card at page 18. Circle No. 224.



**UNIT**

## gives you more EARNING POWER on dragline jobs

more  
**SPEED**  
more  
**POWER**  
more  
**REACH**

Whatever the job — drainage canals, strip mining, gravel and sand stockpiling, irrigation ditches — you'll find that a UNIT Dragline offers the job-proved features you need to beat the competition and deliver more material per shift. You'll get a heaping bucket with every cast for more profitable *earning power* under the most rugged job conditions... you'll get long, wide tracks and rock-steady stability that permits use of longer boom lengths... you'll get dependable swing brakes... you'll get disc-type clutches, interchangeable and self-adjusting for longer service life and lower maintenance costs. Ask any UNIT dealer about UNIT'S straight-in-line engine mounting that gives you more speed and power; UNIT'S twin hook rollers; UNIT'S automatic traction brakes; plus many more outstanding features that make UNIT a real *pay-load partner*.



### FOUNDATION CONSTRUCTION

### CAISSONS

DRILLED AND  
UNDERREAMED

### PIERS

SPECIAL  
DRILLING  
PROBLEMS

Offices in Atlanta, Ga.,  
Pittsburgh, Pa.,  
Washington, D.C.,  
Cleveland, Ohio

Wire or phone for a quotation  
on your next foundation job —  
ANYWHERE IN THE WORLD

### McKINNEY

DRILLING COMPANY

NACOGDOCHES, TEXAS  
Ph.: LOgan 4-3373 • P. O. Box 190

SHOVELS

1/2 to 3/4 YDS.

HOES

1/2 to 3/4 YDS.

**UNIT**  
UNIT CRANE & SHOVEL CORP.  
6309 W. Burnham Street  
Milwaukee 19, Wisconsin

CRANES

5 1/2 to 40 TONS

DRAGLINES

1/2 to 3/4 YDS.

For more facts, use Request Card at page 18 and circle No. 347

For more facts, circle No. 346



David F. Cole, president of Summit Construction, Inc., Lansing, Mich.

"We're working on a reduced volume . . . being choosy about work we bid . . . using a more realistic profit margin."

## How I made money in 1960

### Contractors and Engineers staff article

How can you make money when your competition is bidding work at cost? . . . when labor and materials are going up and bid prices are at a steady low? . . . when Uncle Sam wants a bigger and bigger cut?

Here are seven contractors that made operations pay off in 1960. None has a magic formula for making money, but each uses methods that work well for the particular company in its particular region.

There's general agreement on the need for watching costs. Small items once neglected are now considered to be worth recording. And in field and office there is a constant search for efficiency. In these days of tight money, contractors cannot afford to be bankers. To meet their own financial needs, they have to bear down on collections.

These seven contractors were interviewed in November, when it appeared that for them 1960 would be a profitable year. They pointed out, however, that in this unpredictable business, the remainder of 1960 might change the picture.

The officials of these companies gave their answers on this rather private subject in a spirit of helpfulness, and we congratulate them on their willingness to share the benefits of their experience with others in the industry.

*Summit Construction, Inc., Lansing, Mich., does primarily industrial and commercial building. The company also specializes in sewage-treatment plants. Founded in 1956, it is a young firm with profit-making ideas. Its volume has varied between one and three million dollars.*

David F. Cole, a registered professional engineer and 37-year-old president and owner of the company:

Perhaps we've been lucky, but for the past 18 months we've been showing a profit. We're not getting rich, but we're making more than we're spending. This hasn't always been so. In 1958 and early in 1959, we were



Give your toughest jobs to

# Purple Plus

### Brute Strength

For any job requiring brute strength, Bethlehem Purple Plus, with IWRC, is the rope to use. This fine rope is specially engineered, and is rated 15 pct above the catalog strength of Bethlehem Purple Strand, a fine rope in its own right.

### Abrasion-Resistance

Abrasion-resistance is where Purple Plus shines, thanks to its tough wires, and the extreme care with which the rope is made.

### Durability

Purple Plus is designed for rugged service, thus promoting lower wire rope costs.

Purple Plus, with IWRC, is your best buy for the toughest jobs. It is preformed for easy handling. Full details from the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.  
Export Sales: Bethlehem Steel Export Corporation

Wire rope mill depots and distributors from coast to coast stock Bethlehem Rope

## BETHLEHEM STEEL

For more facts, use Request Card at page 18 and circle No. 348



## THE YEAR'S BIG NEWS in TRANSITS

The Finest Contractor's Transit You Can Buy . . . and AT SUCH A LOW PRICE!

If you're economy-minded AND value-minded, too, here's your transit! We've cut no corners in giving it the precision, ruggedness and features Contractors and Builders want! 24-power internal focusing telescope has finest achromatic coated lens system—5' close focus. Telescope plunges through standard for ease in sighting ahead or back without resetting. Center is special alloy steel with all other parts tough cast Bronze or Brass—no die castings. Features include: ball bearing telescope axle, 2 plate levels, clamp and tangent for circle and center, double centers. Normally plain crosswires, but stadia can be installed. Complete with tripod, mahogany carrying case, plumb ball, magnifier, trivet pins. Weight only 13 1/4 lbs.

SO DURABLE & RUGGED IT SHOULD REQUIRE LITTLE MAINTENANCE DURING A LIFETIME OF SERVICE

Call or write for full details in Bulletin C-11

**WARREN-KNIGHT**  
136 N. 12th St., Phila. 7, Pa.

For more facts, circle No. 349

CONTRACTORS AND ENGINEERS

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ly 13 1/2 lbs.  
IT SHOULD  
NTEINANCE  
OF SERVICE  
letin Q-11  
Pa.

349  
ENGINEER

J. B. Brown, partner,  
Brown Bros., Lansing,  
Mich.

"We're watching our  
whole operation more  
carefully . . . in both  
office and field."



trying to build up our volume. We had  
it up to \$3 million a year. We figured  
the only way to beat the low per-  
centage of profit was to do more work.  
Unfortunately, it didn't work that  
way. We were spreading ourselves so  
thin that we couldn't adequately su-  
pervise or finance the work. Our slim  
profits were soon eaten up by an in-  
efficient operation and interest ex-  
penses.

Now, we're working on a reduced  
volume of about \$1 million a year.  
We're being choosy about the type of  
work we bid, and we are using a more  
realistic profit margin. We give the  
job good supervision, and everybody  
works like hell. These things help  
make a profit.

Other company policies are respon-  
sible for helping the profit picture.  
The company tries to avoid bidding  
on such highly competitive work as  
schools and hospitals. We pick jobs  
other contractors are not as anxious  
to get. We specialize in sewage-treat-  
ment plants—a type of work not as  
competitive, and which requires  
trained personnel.

The company bids on fewer jobs,  
but on these jobs it makes a detailed,  
down-to-the-last-nail estimate. We  
figure that it is a waste of money to  
estimate a large number of jobs in  
the hope of getting one or two. On  
bid work awarded to us within the  
last two years, the low bid averaged  
eight-tenths of 1 per cent beneath  
the next bidder. Most jobs we have  
lost have been by a margin equal to  
the profit added to the estimate.

The company is sometimes willing  
to spend more money on subcontract-  
ors in order to get quality work. With  
the cooperation of competent subs, a  
job can be pushed to an early com-  
pletion. And getting the job done as  
soon as possible is a money-saver.

In order not be saddled with big  
equipment payments, Summit Con-  
struction owns as little equipment as  
possible. We don't have to take prof-  
itless work in order to keep our equip-  
ment running. Much of the company's  
equipment is rented. I even lease my  
personal Falcon station wagon.

Because its fixed overhead is rela-  
tively small, the company doesn't  
need a large volume of work to pay  
off overhead expenses. Its fixed over-  
head (Continued on next page)

Just before the close of 1960, the Arizona Highway De-  
partment had some \$33,090,782 worth of construction  
under contract on the state highway system. The 42  
projects, totaling 180 miles, included four new projects.

## Winslow

### TRUCK SCALES

#### PIT AND PITLESS TYPES

Capacities: 15, 18, 20, 30,  
40, 50, 60 and 70 tons.

For use at temporary and per-  
manent locations, stockpiles,  
and by bituminous material  
contractors at the jobsite.



TYPE CS — PITLESS — PORTABLE

Write or phone  
Dept. B-70 today  
Phone NOrth 1231

WINSLOW GOVERNMENT STANDARD SCALE WORKS, INC.  
25TH & HAYTHORNE TERRE HAUTE, IND.

For more facts, use Request Card at page 18 and circle No. 350

"OKAY--next load goes  
to the cloverleaf!"



## Radio control keeps everyone on the go by keeping drivers in the know!

What caused your last work stoppage? Could  
it have been prevented by radioing your fore-  
men and supervisors the exact job condition—  
letting them send their trucks directly to areas  
where materials or equipment were needed  
immediately? How much time and money  
would you have saved? Take your own  
work. How much time can radio save you in  
conferring, checking, planning, and trouble  
shooting?

Ask a nearby Motorola 2-way radio user.  
Learn firsthand how you and your foremen  
can become more productive—saving miles  
and minutes with each 2-way radio message.

Why Motorola? You get highest dollar value!  
1. A custom-planned system engineered to  
your specific requirements—Motorola as-  
sumes complete responsibility for your system.

2. The right equipment—from the world's  
most complete line of communications tools  
—Motorola has thousands of installations in  
every conceivable type of vehicle. 3. Un-  
matched reliability, proved by the majority  
of the nation's utilities, police, fire and trans-  
portation services—the professional buyers of  
2-way radio. 4. Motorola service by factory-  
trained technicians from nearby maintenance  
centers—keeps your system at factory peak  
performance for long-lasting service and satis-  
faction. These are some of the reasons Motorola  
outsells all other makes combined!

Call your local Motorola Factory Sales Engi-  
neer—or write today to see how 2-way radio  
can most profitably serve you. For companies  
with operations abroad—Motorola sales and  
service are available in 50 countries through-  
out the world.



## MOTOROLA 2-WAY RADIO

Motorola Communications & Electronics, Inc., 4501 Augusta Blvd., Chicago 51, Ill. • A Subsidiary of Motorola Inc.

For more facts, use Request Card at page 18 and circle No. 351



Tom Whetzel, president, Whetzel Construction Co., Champaign, Ill.

"We give the jobs a lot of personal supervision . . . we buy equipment that makes us money."



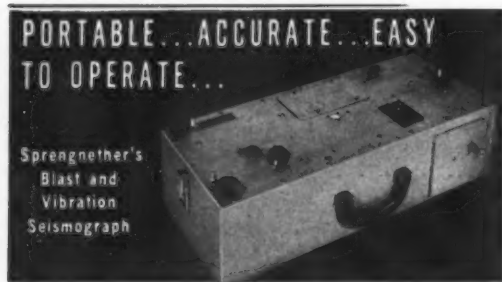
Dean Berenz, president, Dean Berenz Asphalt Co., Bloomington, Ill.

"We have to watch costs very closely . . . We have gone . . . to other types of construction."



F. G. Drompp, general manager and partner of James I. Barnes Construction Co., Logansport, Ind.

"Our company tries to bid a reasonable profit into each job . . . In bidding, we must all raise our sights."



### Protect against nuisance damage claims when pile driving or using explosives

Pile driving and excavation or demolition explosions set up vibrations which owners of near-by buildings may claim caused property damage.

These claims can be unjustified or exaggerated, but are difficult to disprove without adequate supporting facts.

One of the strongest pieces of evidence you can present in your defense is vibration recordings made on the job by a Sprengnether seismograph.

This seismograph is accurate to within 0.1%, so you are able to determine the true magnitude of vibrations and know their effects.

The unit can be carried to any job site. It weighs only 38 lbs. and measures 25 x 10 x 8 inches. No external power source is needed.

No technical training is required to operate the instrument. It takes only minutes to set up.

Your best investment against future nuisance damage claims is a Sprengnether seismograph.

Write for complete information

**W. F. SPRENGNETHER INSTRUMENT CO., INC.**

4567 Swan Avenue

St. Louis 10, Mo.

For more facts, use Request Card at page 18 and circle No. 352

(Continued from preceding page)

head—home-office rent, salaries of supervisors, etc.—are less than 3 per cent of its total volume. The company is able to maintain a low overhead because it operates a simple but functional headquarters building. Supervisors and office help work efficiently and work hard.

Job costs are watched closely. No invoices are paid until the office has a receiving report and assurance that the sub has paid his bills. The sales tax is checked. On state and municipal work, we are not required to pay the state 3 per cent sales tax. You'd be surprised how many times the supplier forgets this fact.

In an effort to speed up collections, we keep in close contact with the owners and architect-engineers. We make them aware of our need for getting money on time. Often, we are successful in talking the owners into reducing the 10 per cent retaining fee as the project nears completion.

(Continued on next page)

## NEW CURVE CROWN WELDED ALL-STEEL PULLEYS

### \*CURVE CROWN DESIGN

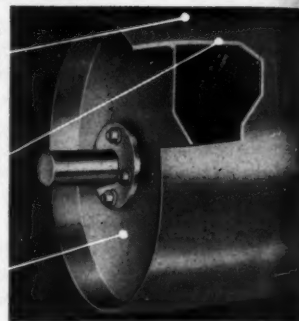
Accurately formed Curve Crown on rim outer ends eliminates belt stretch and wear . . . increases belt training effect more than 100%.

### STURDY RIM CONSTRUCTION

Absolutely round one piece pulley rims formed under hydrostatic pressure. Seam machine-welded inside and out insures 100% weld penetration.

### ACCURATE END PLATE ASSEMBLY

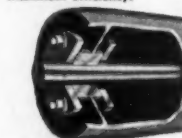
End plates O.D. and I.D. machined to insure concentricity between bore and outer rim. Pressed fit . . . submerged arc welding for maximum efficiency.



### FEATURING "SQUEEZELOCK" HUB DESIGN

Revolutionary "SqueezeLock" Hub design provides gripping power for full torque transmission without keyways plus eliminating distorting loads against pulley end plates.

\*PATENT APPLIED FOR

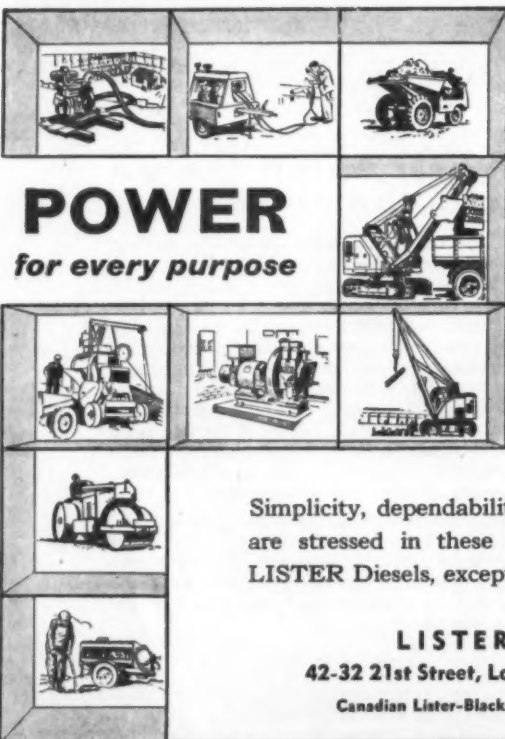


WRITE FOR BULLETIN 558

**STANDARD PRODUCTS DIVISION STEPHENS-ADAMSON MFG. CO.**

97 RIDGEWAY AVENUE • AURORA, ILLINOIS  
PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA  
CLARKSDALE, MISSISSIPPI • BELLEVILLE, ONTARIO

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## POWER for every purpose

## LISTER DIESEL ENGINES

Air-Cooled 1 1/2-72 HP

Water-Cooled to 90 HP

Simplicity, dependability, long life, continuous trouble-free service are stressed in these unbelievably versatile, air-cooled compact LISTER Diesels, exceptionally adapted to your requirements.

**LISTER-BLACKSTONE, Inc.**

42-32 21st Street, Long Island City 1, N. Y. STI 6-8202

Canadian Lister-Blackstone Ltd., 1921 Eglinton Ave. E., Toronto 13, Ont.

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## SPACIOUS TROPICAL GARDENS ON THE BEAUTIFUL BLUE ATLANTIC



Spend your holiday in the ocean-front tropical palm trees and relaxation. Accommodations—efficient apartments, hotel rooms awaits you: putting green, beach, 2 pools, Tap Room, Shop and free parking. Day Fishing, golf, racing—New 4-color brochure today.

Rita Foran, Reservation

## OCEAN RANCH VILLAGE

1110 So. Ocean Blvd. • P.O. Box  
POMPANO BEACH, FLORIDA

For more facts, use Request Card at page 18 and circle No. 355

CONTRACTORS AND ENGINEERS



H. W. Gausman, vice president, Cooper Construction Co., Omaha, Nebr.

"We've been lucky... we haven't run into... unforeseen trouble... we haven't been delayed by strikes."



Lee C. Brown, one of the partners, Brown Bros., Lansing, Mich.

"We try to make the most of the equipment we have... specialization gives us advantages in bidding."



H. J. Feldman, president, Malan Construction Corp., New York, N. Y., with his four sons.

"Diversity allows us... to weather any individual industry downturn."

To get out of the bear pit of irresponsible competitive bidding, the company has tried to get more negotiated work. With the trust of the architect and the owner, the company can work out a price that allows for a legitimate profit and the quality of workmanship that builds repeat business.

What's a legitimate profit? I'd say 5 per cent over and above all expenses... and it's hard work if you get it.

Malan Construction Corp., New York, N. Y., with a gross up 55 per cent over 1959 and a current \$60 million backlog, has just completed the best year in its 17-year history. About the only type of contract it has not bid is dams. About six months ago, the company opened a Chicago branch office to meet the needs of an increasing list of contracts throughout the Midwest. Virtually the only assistance it gets from the New York headquarters at present is in estimating. A Washington, D. C., branch has also been opened recently. Both branches are expected to bid, obtain, and supervise work on their own by the end of 1961. Another office is expected to be opened soon in Sao Paulo, Brazil.

H. J. Feldman, president and father of the four sons who help him run the business:

Probably our biggest advantage lies in our diversity, which allows us an excellent opportunity to weather any individual industry downturn. Malan has achieved a sensible balance between governmental and private industrial contracts.

Because we try to finish every contract ahead of schedule, we have to make the dirt fly almost before the ink is dry on the contract. This means money in the bank to us and gives clients confidence in our ability—an important factor when it comes to securing future contracts.

To reduce the start-up on each project, estimating and purchasing procedures have been geared for swift, efficient work. About 12 days before a bid is submitted, for instance, a member of the purchasing staff and a project superintendent are assigned to the estimating department.

(Continued on next page)

## SUPERIOR

### The dependable source for ALL concrete forming accessories

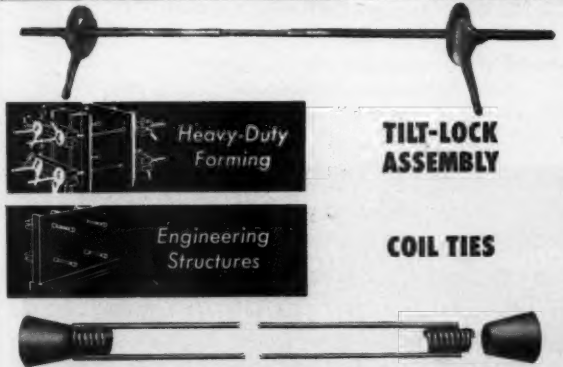
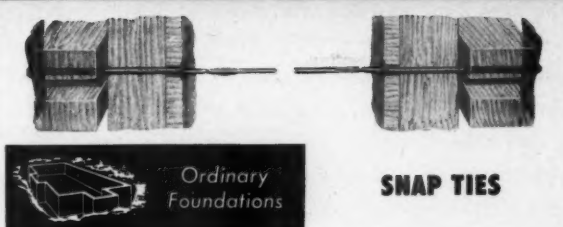
Here are representative types of form ties, anchors, inserts, hangers, as well as several new items in Superior's most complete line of concrete accessories. Illustrated is the variety of concrete form work and related jobs in which Superior accessories are used. All Superior accessories are designed to provide the most dependable and efficient forming methods.

WHENEVER YOU ARE PLANNING FORM WORK Superior's technical assistance is available to prepare layouts. Call nearest office shown below.

For details request CATALOG 700

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9301 King Street, Franklin Park, Illinois (A Suburb of Chicago)  
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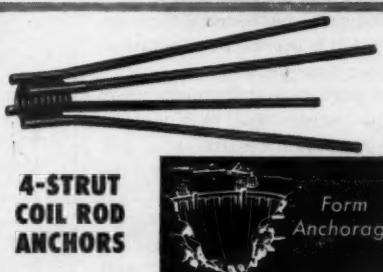
#### NEW



PRES-STEEL HANGERS (Patent Pending)



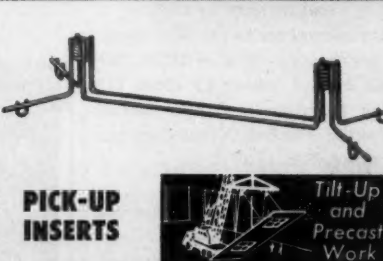
ADJUSTABLE Screenshot SUPPORTS



4-STRUT COIL ROD ANCHORS



RISERFRAMES



PICK-UP INSERTS

For more facts, use Request Card at page 18 and circle No. 356

(Continued from preceding page)

ment to help with the bid preparation. Both executives thus become very familiar with the contract requirements.

Then, as soon as we get a job, we can immediately staff the field office, purchase equipment and materials needed, and get subcontractors to handle the various specialty trades. The added expense of having these specialists work on bid preparation is more than offset by the speed gained in breaking ground.

Field offices are staffed according to contract requirements, not the dollar value of the job. We always place the project supervision where it belongs—in the field.

We have also developed a special expediting chart that enables us to make sure subcontractors are being efficiently used. The chart pinpoints materials purchased or fabricated by subs and scheduled delivery dates to the job site, and helps assure a steady flow of materials without costly waste.

We can tell in advance if one of our subs will run into trouble getting an order delivered on time. Anticipating these delays allows us an opportunity to make adjustments on the spot.

When Malan requires heavy equipment, it rents. It doesn't maintain a huge equipment inventory to be shipped around the country, because transportation charges pile up fast when you're spread out. By renting equipment locally, we avoid tying up cash and reduce maintenance costs. If a rig breaks down, we simply call the owner for replacements, and costly downtime is minimized.

Blending old, time-tested management techniques with improved modern methods is a continuing challenge to Malan. The company tries to meet the test with experienced supervisory talent that is capable of adjusting to changing conditions.

You don't make strides and a profit in this industry with trick mirrors. It's a business of concrete, steel, and a lot of know-how. We stress the know-how, making it a rule that company executives roll up their sleeves and get out in the field on a day-to-day basis to direct operational staff work. I'd say that a good combination of experience and management is what brought the company record profits in a generally unsatisfactory year for the industry. If the past is any guide to the future, we'll have little trouble maintaining our growth rate in 1961.

*James I. Barnes Construction Co., Logansport, Ind., is a building contractor with geographically widespread operations. Although the company is headquartered in Indiana, it has three branches on the West Coast and one branch office in Ohio. The sizable annual volume of about \$12 million is primarily in commercial and public buildings. The company was founded in 1895.*

**F. G. Drompp, general manager and partner:**

Although our volume has dropped from last year, we expect to come up

with a profit in 1960. Our company tries to bid a reasonable profit into each job, even though competition makes this figure less than we would like.

In order to get work with a reasonable profit margin, we bid many more jobs, and every so often we catch one that doesn't go so cheap. Once we get a job, we try to take advantage of every cost-cutting method of construction. In the office, we cut corners and watch expenses. We've recently put in N. C. R. book-keeping and payroll machines that have been helpful in reducing clerical personnel and speeding up the work.

Payrolls are now made up in the branch offices rather than in the field offices.

We've been getting the breaks this year. The weather has been favorable, and we've had no serious trouble with the unions.

Profits these days hardly justify the many risks involved. I think the post-war idea of "Do a big volume at a small profit" has permeated the construction industry, and this idea is one thing when your costs are known before the selling price is set. In the construction industry, where every job is custom-built, the contractor sells the job before he builds

it. This may require a year or more to do. There are too many risks and unknown contingencies to permit this type of operation. In bidding we must all raise our sights.

*Brown Bros., Lansing, Mich., is a bridge-building firm that specializes in over-the-water bridges. Organized in 1949, the company now does a yearly volume of about \$2½ million. Most of its work is in Michigan, although the company has built bridges in Indiana and Wisconsin.*

**J. B. "Doc" Brown, and Lee C. Brown, partners:**

## Better service accessibility alone makes the "Euc" C-6 your best tractor buy

In the Euclid C-6 crawler you get the advantages of job proved components and years-ahead engineering that keeps down-time and operating cost to the absolute minimum. You get unitized assembly of major components and service accessibility that is unsurpassed by any crawler . . . replacement labor costs are well below those for comparable tractors. For example, complete removal and replacement of a C-6 radiator takes less than one third of the time required for the same work on a competitive machine.

With easy accessibility for servicing and maintenance, the C-6 gives more work-time on the job . . . steps up production . . . helps beat the profit squeeze by cutting operating costs to a new low.

**EUCLID Division of General Motors**  
Cleveland 17, Ohio

Plants at Cleveland and Hudson, Ohio  
and Lanarkshire, Scotland

*Full-power shift... this Euclid C-6  
crawler responds like nothing  
you've ever touched!*

**Get all the facts and figures on  
the C-6... you'll find low operating  
cost plus proven reliable performance  
make it your best tractor investment**



In 1959, we lost money. This year, it looks as though we might make a little, and it's not because our bid prices are coming up any. It's because we're watching our whole operation more carefully. It's a matter of down-to-the-bone efficiency in both office and field. We've got to make a little on every job, because these days there's no such thing as a big-profit job.

With the price of new equipment so high, we try to make the most efficient use of the equipment we have. Take our Michigan front-end loader, for example. We've rigged it up so it can be converted from a bucket to a

fork-lift in 15 minutes. And from a fork-lift to a shop-built boom in less time than that. Before, it took two men about an hour to make the change. Now it takes one man 15 minutes.

To balance the work load, we do some foundation and excavation work for industry. When our bids on state bridges don't come through, we generally have some industrial work to tide us over.

Specialization gives us some advantages in bidding. We've got the equipment for building marine bridges, and we've got the men who know how to build them. This is the

type of job at which we are most competitive.

The company is getting tougher on collections. It takes all legal precautions to insure the prompt payment of money owed. The firm files more liens than it used to. If bills receivable run over 60 days, we slap an interest charge on them. The company is not as prone as before to listen to excuses for nonpayment.

Our management is made more efficient with modern office equipment. For automatic posting and recording, the main office has a Burroughs book-keeping machine. A powerful radio transmitter allows the home office to

keep in touch with jobs in the area. Field offices are also well equipped. Each trailer office has a tape adding machine and an electric calculator. For hot-weather operating efficiency, each field office is air-conditioned.

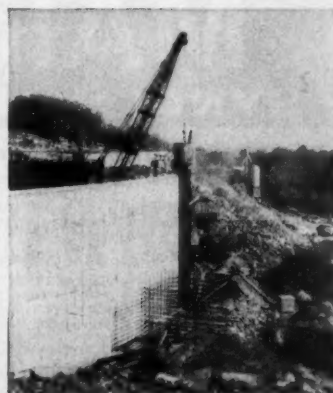
In 1959, the company tried to run a full crew through the winter. The operation proved costly, and this winter we expect to do less work and retain only key men.

*Whetzel Construction Co., Champaign, Ill., is a contractor that does primarily grading and paving of city streets. The annual volume runs about \$500,000.*

**Tom Whetzel, president:**

Our volume this year has been

#### PROGRESS IN CONCRETE



**28 Ft. High, 320 Ft. Diam.  
Concrete Water Tanks**

**... Erected in 63 Ft. Sections  
with Symons Steel-Ply Forms**

Springfield, Massachusetts doubled its pure water reservoir capacity by addition of the two largest prestressed concrete tanks ever to be constructed in America. The tanks are located on top of Provin Mountain, about 5 miles west of the city.

Diameter of each tank is 320 feet and the walls are 28 feet high. Walls were erected in sixteen sections, with each ganged section being 63 feet wide.



General view of the two big reservoirs. Designed by Bogert and Childs of New York City.

After each pour, Symons Steel-Ply Forms were backed off and swung over to the next section for pouring. Construction was handled by the joint venture firms of Fruin-Colnan Contracting Co., Inc., St. Louis, Mo. and C. & C. Construction Co., Fort Wayne, Indiana.

For the complete story on America's Two Largest Water Tanks, just send in your request on your company letterhead. Symons Steel-Ply Forms are rented with purchase option.

**Symons**  
**SYMONS CLAMP & MFG. CO.**  
4251 Diversay Ave., Dept. A-1, Chicago 39, Ill.  
Warehouses Thruout the U.S.A.

MORE SAVINGS FROM SYMONS

For more facts, circle No. 358

111

**"Euc" C-6 gives you the advantage of easier servicing plus these top performance features:**

- PROVEN POWER
- PROVEN TORQMATIC DRIVE
- FULL POWER SHIFT
- COMMON STEERING-BRAKING
- FAST-AS-A-FOX RESPONSE
- EXCEPTIONAL MANEUVERABILITY

Brief specifications... 211 net h.p. delivered to power train... torque converter and semi-automatic transmission... independently suspended final drives... oil cooled multiple disc brakes... dry type air cleaner... 7 track rollers on each side... rear-mounted radiator.

**A NEW DESIGN CONCEPT THAT SETS NEW STANDARDS FOR PERFORMANCE AND LOW OPERATING COST IN THE 200 H.P. TRACTOR CLASS**



**EUCLID**

FOR MOVING EARTH, ROCK, COAL AND ORE

(Continued from preceding page)

about the same as last. We've had to shave profits a little to get the work, but it looks as though we will still make a little money.

We're a small company. We give the jobs a lot of personal supervision. Much of my time is spent out on the job supervising the work. Heck, I couldn't stay in the office, anyway. Those four walls would drive me crazy.

We have a nice home office, but it's hard to keep anyone in it. Even our bookkeeper, after he gets his work done, comes out and directs one of the jobs.

As far as rigs go, we try to buy equipment that makes us money.

We have a nucleus of about 15 men.

Each of them knows his job and does it well. The men stay with us year after year. Perhaps our profit-sharing plan has something to do with that. When we do make a profit, we share it with the men, and the money is put into a retirement fund.

*Cooper Construction Co., Omaha, Nebr., is a small building contractor that does about a \$2 million annual volume, primarily in commercial and industrial buildings. Most of its work is done within a 50-mile radius of Omaha.*

**H. W. Gausman, vice president:**

It's been a fairly good year; our volume has increased from \$1 million last year to about \$2½ million this

year. Profits are still mighty slim, but it looks as though we will come out on top in 1960.

We've been lucky. We haven't run into any unforeseen trouble on the jobs. The weather has been good, and we haven't been delayed by strikes. If we had a few bad breaks, I wouldn't be talking about profits.

Basically, we haven't changed our operations. We've always tried to maintain an efficient operation. Of course, we keep a close eye on costs. We keep experienced, well trained craftsmen working for us, and we make use of modern equipment and time-saving building methods.

If you do these things, and have a little bit of luck, you can make it.

*Dean Berenz Asphalt Co., a 60-*

*year-old firm in Bloomington, Ill., is a contractor that does asphalt resurfacing, as well as some concrete paving. About 60 per cent of its annual volume of approximately \$300,000 is municipal work. About 30 per cent is state highway construction.*

**Dean Berenz, president:**

Making a profit is becoming increasingly difficult. Our competition often takes the work at cost just to keep the equipment running. Sometimes we are forced to do this, but in general we are able to bid a small profit into the job. This year has been slightly better than last. At this time, it looks as if we'll make a profit.

In order to make money, we have to watch our costs very closely. Small-

# MARVEL SYNCLINAL FILTERS

**FOR DEPENDABLE PROTECTION on all Hydraulic and other low pressure circulating systems**

Designed to give more ACTIVE filtering area—MORE dependable protection—MORE productive operation before cleaning is necessary. Meet J.I.C. Standards.



## A—Synclinal SUMP TYPE

**CAPACITIES:** 5—8—10—20—30—50—75 and 100 G.P.M.  
**PIPE SIZES:** ½"—1"—1½"—2"—2½" and 3".  
**CONNECTIONS:** Coupling—Male Nipple.  
**BY-PASS VALVE:** Not available.

## B—Synclinal LINE TYPE

**CAPACITIES:** 5—8—10—20—30—50—75 and 100 G.P.M.  
**PIPE SIZES:** ½"—1"—1½"—2"—2½" and 3".  
**BY-PASS VALVE:** Not available.  
**OPERATING PRESSURES:** Up to 80 p.s.i.

## C—Bonded LINE TYPE

**CAPACITIES:** 10—20—30—50 and 75 G.P.M.  
**PIPE SIZES:** 1"—1½"—2" and 2½".  
**BY-PASS VALVE:** Available with or without.  
**OPERATING PRESSURE:** Up to 250 p.s.i.  
**OPERATING TEMPERATURES:** up to 300° F.

## D—IN-LINE FILTER

**CAPACITIES:** Up to 60 G.P.M.  
**PIPE SIZES:** ½"—1"—1½" and 1½" (at both inlet and outlet).  
**BY-PASS VALVE:** Available with or without.

## E—Bonded SUMP TYPE

**CAPACITIES:** 10—20—30—50 and 75 G.P.M.  
**PIPE SIZES:** 1"—1½"—2" and 2½".  
**CONNECTIONS:** Coupling—"O" Ring—Male Nipple.  
**BY-PASS VALVE:** Available with or without.

## F—Tandem SUMP TYPE

**CAPACITIES:** 10—16—20—40—60—100—150 and 200 G.P.M.  
**PIPE SIZES:** ½"—1"—1½"—2"—2½" and 3".  
**CONNECTIONS:** Coupling—Male Nipple.  
**BY-PASS VALVE:** Not available.



**FILTERING MEDIA** in all Marvel Filters is Monel wire cloth available in mesh sizes of 30-40-50-60-80-100-150 and 200 to meet your filtration requirement.

**EASY TO CLEAN**—All Marvel Filters are easy to clean. Line type units operate in any position and may be serviced without disturbing pipe connections.

**OVER 900 O. E. M.'s** install Marvel Filters as Standard Equipment.

**IMMEDIATE DELIVERY**

For further information on a specific type filter—  
Write—wire or phone

**MARVEL ENGINEERING COMPANY**

7227 N. Hamlin Ave., Chicago 45, Ill.

Phone: JU niper 8-6023



Please send me information on Marvel Filters as indicated:

☐ Hydraulic Oils ☐ Coolants ☐ Lubricants ☐ Fire Resistant Fluids  
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Name \_\_\_\_\_  
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For more facts, use coupon.

EMPTY ANY HOPPER CAR EASILY, SAFELY, QUICKLY

SYNTRON

VIBRATORY

CAR SHAKERS



**GIVE TOP PERFORMANCE WHEN MOUNTED ANYWHERE ALONG THE LENGTH OF ANY SIZE CAR**



For further information in detail write for a Syntron Catalog

Whether your operation requires emptying one car a week or many cars per day, a Syntron Car Shaker will reduce labor cost and demurrage. Syntron Car Shakers transmit powerful vibrations throughout the car to loosen and shake the compacted material down through the open hopper gates. Syntron Car Shakers feature—Rotary Vibrator Unit, powerful, weatherproof, produces 900 vibrations per minute, simplicity of design—counter weight simplifies mounting and operating, permits mounting over either light or heavy flanged frame. One man can easily install and operate this Car Shaker with complete safety. No need to get in, on, or under car.

All of Syntron's vast experience with Vibratory equipment contributes to the effectiveness of this unique Car Shaker. Syntron Engineers are available to discuss the details of each application.

61C51

SYNTRON

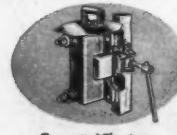
**SYNTRON COMPANY**

227 Lexington Avenue • Homer City, Pa.

Other Syntron Equipment of proven dependability quality



Bin Vibrators



Concrete Vibrators



Vibrating Screens

For more facts, use Request Card at page 18 and circle No. 359

CONTRACTORS AND ENGINEERS

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ENGINEERS

expense items that we didn't worry about before we now take the trouble to record. We train our foremen to break down the cost distribution carefully on their daily reports. To make the foremen more cost conscious, certain costs are figured in the field office. The remaining breakdown is done in the home office.

We're always looking for equipment that will reduce expensive hand labor.

For a more efficient operation in the field, we have been giving the work closer supervision. We have increased our number of supervisors to the ratio of about one foreman for every eight men.

To extend our working season, we have gone from strictly asphalt work to other types of construction. We now do sewer and culvert work, building demolition, and underground conduit construction for power and telephone companies. This type of construction keeps our crews busy until fairly late in the season.

THE END

## Structural steel subject of book

■ "Erecting Structural Steel," by Samuel P. Oppenheimer, is a practical guide for engineers, construction superintendents, estimators, and others in the field.

The 272-page book gives detailed descriptions of modern methods for erecting a variety of steel buildings, and provides a working knowledge of such factors as uses of equipment, tools, and scaffolding, key formulas, rules of thumb, graphic techniques and important aspects of sales and management. Every phase of structural erection is covered from basic planning to installation of roof and beams.

Also included are recent developments in such areas as reinforced-concrete construction and the structural steel frame, plus information on slewing and automotive cranes, welding guns, high-strength bolts, and other equipment. Sample work-control and office forms are provided.

The book is available from McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y. Price is \$9.50.

## Text on fluid mechanics

■ The derivation and application of the fundamental equations of fluid mechanics are discussed in "Elementary Theoretical Fluid Mechanics," by Karl Brenkert, Jr.

The 349-page book is divided into eight general sections. Subjects covered are fluid statics; conservation of matter and the Euler equation; momentum and angular momentum; conservation of energy; friction; dimensional analysis and model study; and potential flow.

The book contains 374 problems, ranging in difficulty, and includes much calculus to demonstrate its use together with the general form of fundamental equations.

The book, priced at \$7.50, may be obtained from the publisher, John Wiley & Sons, Inc., at 440 Park Ave. South, New York, N. Y.

## Lincoln Electric bulletin on arc-welding education

■ The Lincoln Electric Co., Cleveland, Ohio, has published a new bulletin outlining its program in arc-welding education. The Lincoln Welding School offers a basic 5-week course covering the fundamentals of manual metallic arc welding. The course can be expanded to over 11 weeks by including supplemental training in such areas as pipe welding, hardsurfacing, alloy welding, semiautomatic submerged-arc welding, and tungsten inert-gas welding. The bulletin includes a registration form and a summary of fees charged.

For free copies of the bulletin (AV-111), write to The Lincoln Electric Co., Cleveland, Ohio.

The federal government collected more than \$4.3 billion in automotive excise taxes during fiscal 1960. The total federal excise taxes paid by highway users since 1932, when the taxes were imposed, is almost \$40 billion.

DIGGING CHISEL



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**FROST**

FROST WEDGE



**TOOLS**

... Keep tight  
winter-schedule  
jobs moving

Frozen ground gives away easily to the scientifically shaped Brunner & Lay Frost Tools. 77 years of forging and heat treating experience say they're better. Request complete catalog #759. Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. Plants, conversion shops, dealers from coast to coast.

**Brunner & Lay**  
MOIL POINTS • CLAY SPADES • ASPHALT CUTTERS, etc. • Carbide ROK-Bits • DRILL RODS • COUPLINGS • ADAPTERS • STRIKING BARS • SECTIONAL STEEL

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# H&L

## Teeth that really dig

### FOR THE MEN WHO....

# MOVE THE EARTH

### Stay Sharp - Last Longer

## MOVE MORE EARTH

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**H&L** has a point for every type of digging job, and for every make and model of digging equipment.

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**TOOTH COMPANY**  
1340 SOUTH GREENWOOD AVE.  
MONTEBELLO, CALIFORNIA

**SPECIALISTS** SPECIALIZING IN THE MANUFACTURE OF BETTER DIGGING POINTS FOR OVER 30 YEARS

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1340 SOUTH GREENWOOD AVE.  
MONTEBELLO, CALIFORNIA

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## Maintenance

Lube rigs, fuel trucks,  
and open-air shops comprise



## Maintenance setup for two years of grading

Maintenance crews, working for the paving contractor on Interstate 80 over the Golconda Summit in Nevada, start their job at the close of the 9-hour shift. While the field mechanic looks over this D8 and L-W scraper, the lube crew handles servicing with one of three Lincoln-equipped vans on the project.

Contractors and Engineers staff article

When the Silver State Construction Co. started work on the \$3.7 million job of building 12 miles of new Interstate 80 over Golconda Summit east of Winnemucca, Nev., owner A. D. Drumm, Jr., called for a good maintenance setup. The plan was to keep the equipment working right there on the job for nearly two years. (See "Grading Problem: Water Supply," page 24.)

Drumm established his field office, shop, and yard in the valley near the west end of the project. Here, the crews cast a 20 x 40-foot concrete slab 6 inches thick to serve as the shop area. Supply trailers containing parts, lubricants, tires, cable, and other necessary supplies were backed up against the two long sides of the slab, and steps were placed for easy access to the trailers.

To facilitate the lifting of heavy parts, the contractor improvised an overhead crane by placing a heavy steel beam on two timber posts, which were set in concrete on the ground at the edges of the slab. A rolling carrier

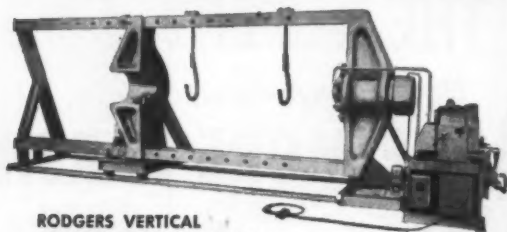
THE MOST FOR YOUR MONEY!...

## Rodgers Forcing Presses

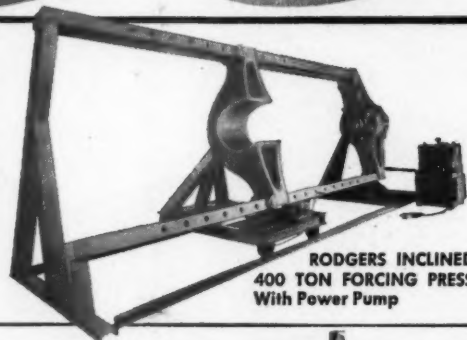
Greater  
Versatility

Rugged  
Power

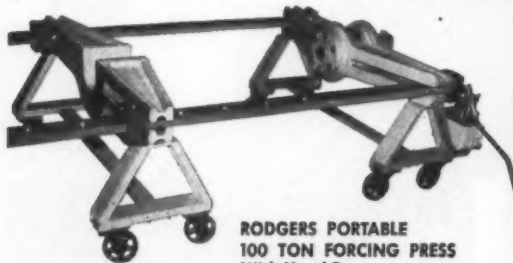
Flexible  
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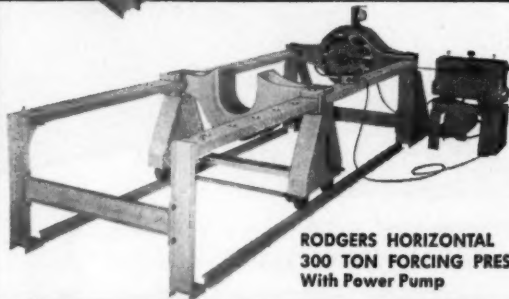
RODGERS VERTICAL  
600 TON FORCING PRESS  
With Adaptors and Hooks



RODGERS INCLINED  
400 TON FORCING PRESS  
With Power Pump



RODGERS PORTABLE  
100 TON FORCING PRESS  
With Hand Pump



RODGERS HORIZONTAL  
300 TON FORCING PRESS  
With Power Pump

When you buy a Rodgers Forcing Press, you are not tying up your money in a single purpose tool. Compared with other presses, Rodgers design permits a wider variety of jobs to be handled—from the full tonnage capacity of the press, on heavy duty work, to partial capacities required for light jobs.

Rodgers Press design also offers unique flexibility in the interchangeability of cylinders and power source. Each press can be easily modified to suit changing job requirements. And an "extra" feature is the simple way the cylinder and pump may be detached for jacking, pulling and pressing work in the shop or field. Rodgers positive, accurate controls may be used at the press or remote.

When you check Rodgers Forcing Presses, feature for feature, their rugged construction, fast, positive action, and the variety of adaptors, hooks and other accessories available, you will be convinced that a Rodgers will give you the most for your money.

Rodgers Forcing Presses are available in standard, horizontal, vertical, inclined and portable models... capacities from 100 to 600 tons... with power or hand pumps.

Write for Catalog No. 315A... it gives  
complete details and specifications.



**RODGERS HYDRAULIC, Inc.**

Pioneers in High Pressure Hydraulics Since 1932

7415 Walker Street

Minneapolis 16, Minnesota

For more facts, use Request Card at page 18 and circle No. 362

### ROTARY SWEEPER BROOMS

WE MANUFACTURE ALL SIZES

NAME YOURS

- Austin-Western
- Cab Lowboy
- Del-Harvester
- Fordson
- Fergusson
- Grass
- Gutterwiper
- Hoogh
- Huber
- Jags
- Littleford
- Little Giant
- Melli (W.B.)
- Blumberg
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- Tambo
- Wayne 2430
- and others



\$6950 up

Brooms filled with fibers of Palm-Hickory-Bass-Spring Steel Wires or DuPonts Nylon.

SAVE MONEY — if you fill your own order core only without filler.

RE FILLING any make size or BUILDING type. New slat-PAIRING hubs-shaft-cable.

WE SHIP WORLDWIDE-IMMEDIATELY Road Builders — it's sensational! ROAD DRAG LEVELERS BROOMS

BIG PECKERWOOD BIG

For even distribution of materials six inches wide — lengths to 12 feet. No frame required.



ONLY \$350 FOOT IN STOCK LENGTHS 4', 6', 8', 10' or 12'

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KENNEDY'S

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For more facts, circle No. 363

CONTRACTORS AND ENGINEERS

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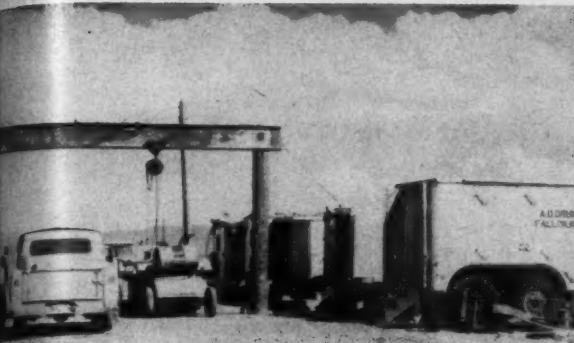
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63  
ENGINEERS



◀ A Yale hoist riding a steel crane beam set on timber posts helps mechanics pick up heavy parts at the field shop. Trailers are for parts, lubricants, tires, cable, and other supplies.

A useful rig is this Hyster truck, which picks up a big Cat diesel engine from a trailer making delivery and brings it to the storage yard. It also helped mechanics with heavy lifts. ▶



on the lower flange of the beam carries a Yale differential hoist that mechanics use to remove and replace many of the heavy parts.

During the first summer of work, the shop area was left open. Except for some nuisance from wind and dust, this was quite satisfactory, since there is practically no rain in this area. With the approach of winter, and snow certain, the shop area was enclosed and provided with heat and lights.

Although practically all the maintenance of grading equipment was handled from this field shop, an occasional rig was sent back to the main shops in Fallon, Nev., for major overhaul.

#### Field lubrication, fueling

Three mobile lube vans carrying Lincoln equipment served all the rigs in the field. The grading layout included 6 rubber-tire scrapers, 6 crawler-tractor-scrappers, 6 motor graders, 16 tractors, 10 drill rigs, 2 power shovels, 6 "Euc" end-dumps, a number of pumps on the water system, and the usual array of incidental machines.

At the close of the 9-hour shift each day, the lube crews and field mechanics covered the long job site, giving each machine its necessary lubrication and servicing, plus a careful preventive-maintenance check. Chevron RPM lubricants and fuels were used exclusively.

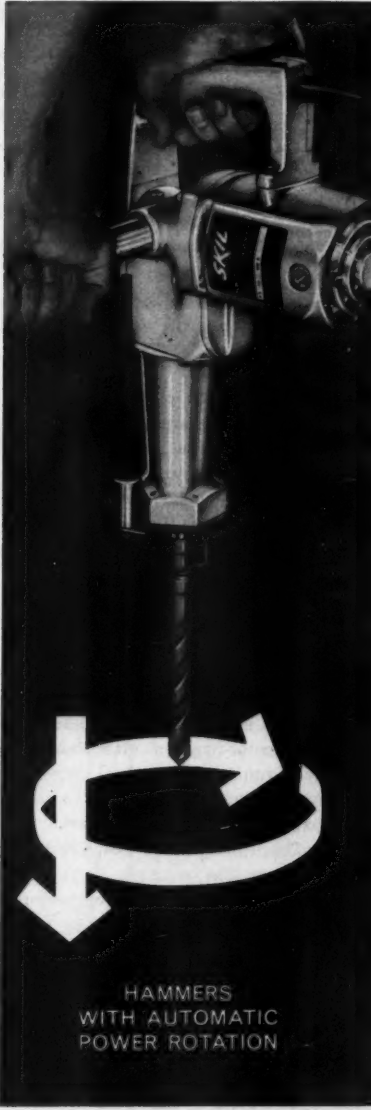
In the shop area, the contractor set up tanks for 50,000 gallons of diesel-fuel storage. The supply in these tanks was replenished regularly by truck transports. Three fuel trucks, with capacities ranging from 1,500 to 4,000 gallons, refueled all of the equipment in the field once a day, after the close of the shift.

Incidental items that aided and improved the operations in the shop and yard included a Malsbary steam cleaner for removing the dirt and grease from machines coming into the shop for work. A Hyster lift truck was also a busy rig. It helped the mechanics with the heavy lifts on equipment repairs, loaded and unloaded heavy items from trucks, and stockpiled materials in the yard.

THE END

#### New service branch for B-D

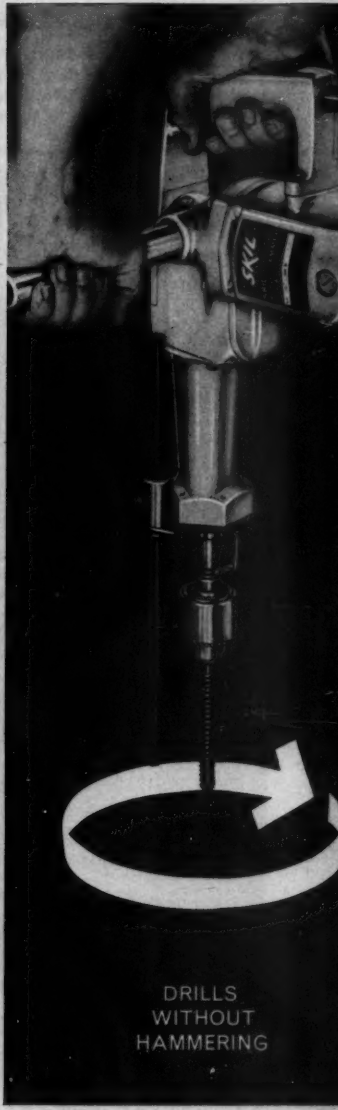
Black & Decker Mfg. Co., Towson, Md., recently opened its 50th factory service branch in the United States in Beverly Hills, Chicago.



HAMMERS  
WITH AUTOMATIC  
POWER ROTATION



HAMMERS  
WITHOUT  
ROTATION



DRILLS  
WITHOUT  
HAMMERING

## New! Revolutionary Skil Roto-Hammer

Exclusive 3-way action obsoletes all other electric hammers!

It's actually 3 different tools in one:

**Powerful hammer with automatic power rotation** that drills holes in masonry up to 65 times faster than by hand... up to 5 times faster than ordinary hammers... without tiresome rotation of star drills.

**Hammer without rotary action** for all kinds of hammering jobs, including channeling, routing, chiseling, riveting, demolition work, setting self-drilling anchors.

**Drill without hammering action** for boring holes in masonry, wood, metal, or any

material that can be drilled with standard electric drills.

Costs per hole are lowest of any hammer (see chart). Maintenance costs are lowest, too, because of unique "electropneumatic" drive. No springs to break... powerful hammering is air actuated.

Ask your Skil distributor for demonstration of Model 726 (1/2-1 inch) and Model 736 (1-2 inch). Or write for 8-page brochure. Skil Corporation, 5033 Elston Ave., Chicago 30, Ill. Attention: Dept. 107A.

LOWEST COST PER HOLE		
Based on 1000 holes (3/4" x 4" deep) in masonry—labor at \$3.00 per hr.		
SKIL NO. 726 HAMMER	ORDINARY HAMMER	
1 Carbide Bit* needed	24 Star Drills needed	
19.38 hours of labor	100.4 hours of labor	
\$80.14 (labor & bit)	\$337.20 (labor & bits)	
8¢ per hole	34¢ per hole	

\*New SKIL Carbide Bits stay sharp 20 to 30 times longer than star drills.



...and SKILSAW POWER TOOLS

For more facts, use Request Card at page 18 and circle No. 364

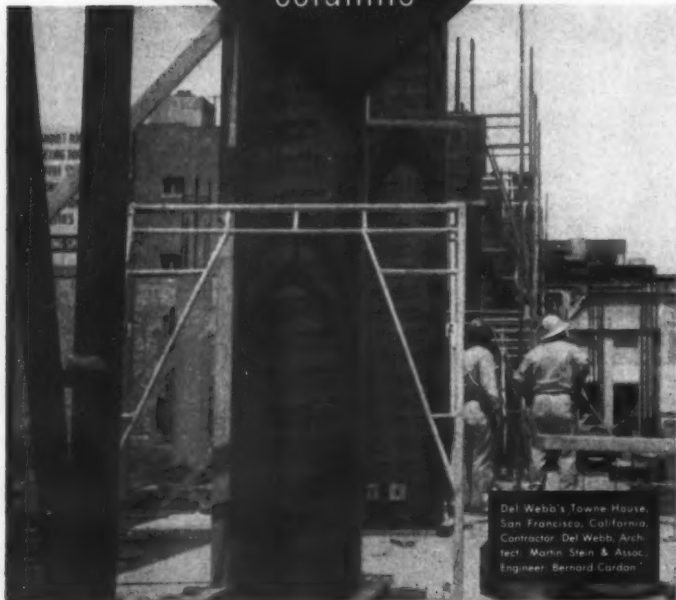


From 650 to 700 feet of canal excavation going 2.8 feet in depth is a daily average for this Lorain L15 with 3/4-yard dragline bucket working on lateral canals for the Helena Valley Irrigation unit in Montana. Some 48 miles of canals are being built to serve 12,000 acres.



Maintenance of irrigation ditches in the Lower Tule River Irrigation District around Woodville, Calif., is a routine operation now for this Cat No. 14 grader with Briscoe grader-sloper. Operator and rig handle the entire job; there is no spoil material atop the bank to clean up.

## You Save Eight Ways on round concrete columns



... when you form them with

### SONOCO **Sonotube** FIBRE FORMS

For economy, speed and ease of handling, Sonoco SONOTUBE Fibre Forms are better than wood... better than steel... and the best in fibre. These lightweight, low-cost forms save contractors time, labor and money by providing the fastest, most economical method of forming all types of round concrete columns, piers, posts, underpinning, etc.

#### Count up your savings with SONOTUBE Fibre Forms:

**SAVE** cost of loading and shipping permanent forms to job site.

**SAVE** cost of bolting or nailing permanent forms together. SONOTUBE Fibre Forms can be placed easily by semi-skilled labor.

**SAVE** placing, plumbing, bracing time and labor.

**SAVE** stripping time—easily cut from column.

**SAVE** cleaning, re-oiling, re-assembling, and return-shipping of permanent forms.

**SAVE** job time because any number of columns can be set, poured at one time.

**SAVE** curing time and labor—provide self-cure without need of special compounds or treatments.

**SAVE** capital—there's no permanent investment in forms.

Use Sonoco SONOTUBE Fibre Forms and save time, labor, and money on round concrete columns. Order standard 18' lengths or specified lengths—sizes 2" to 48" I. D. Can be sawed.

See our catalog in Sweet's, or write for complete information to

## SONOCO Construction Products

SONOCO PRODUCTS COMPANY, Norwalk, Conn. • La Puente, Calif. • Fremont, Calif. • Montclair, N. J. • Akron, Indiana • Longview, Texas • Atlanta, Ga. • Ravenna, Ohio • Brantford, Ont. • Mexico, D. F.

For more facts, use Request Card at page 18 and circle No. 366

## Distributor Doings

### Detroit Diesel offers new overhaul service

Distributors of the Detroit Diesel Engine Division of General Motors, Detroit, Mich., are offering to Diesel engine owners a new service which gives written assurance that all overhauls they make conform to the standards set by the division.

The factory provides two forms, which are processed by the dealer and given to the customer when the overhaul is completed. An Engine Test Report indicates the number of pre-start and run-in checks made, the duration of basic run-in periods at various engine speeds and loads, adjustments required after both the basic run-in and the final inspection, and engine characteristics as shown by the final dynamometer test.

The Dynamometer Test Certificate confirms the overhaul. It is dated, identifies the engine by serial number, and certifies the brake horsepower attained. It enables the owner to determine accurately the number of hours worked or miles traveled, between overhauls.

### A-C distributor news

The Texas Tractor Co., 220 N. Glenwood Blvd., Tyler, Texas, succeeds the Miller Machinery Co. as the distributor for the full line of products of the Construction Machinery Division of Allis-Chalmers Mfg. Co., Milwaukee, Wis., in 37 east Texas counties.

New owners, W. G. Lewis, Orville R. Brogdon, and Carlos Watson, Jr., purchased 100 per cent of the stock of Miller Machinery Co. and hold an equal interest in the purchase.

Brogdon will direct all operations at Texas Tractor.

### B-E dealer area expanded

The ZECO Co., 2929 University Ave. S. E., Minneapolis, Minn., a crane-excavator distributor for the Bucyrus-Erie Co., South Milwaukee, Wis., has added a 21-county area in west cen-

tral Wisconsin to its Minnesota territory. In northeastern Minnesota, however, the dealer will relinquish 18 counties.

ZECO handles the complete line of Bucyrus-Erie convertible crane-excavators, dragline buckets, track machines, and Hydrocrane equipment with clamshell, hoe, and shovel attachments.

### News of distributors for Koehring divisions

Western Machinery Co., Inc., 3811 S. Treadaway, Abilene, Texas, has been appointed a distributor in the Texas Panhandle area for the Buffalo-Springfield, C. S. Johnson, and Kwik-Mix divisions of the Koehring Co., Milwaukee, Wis.

The dealer will handle Buffalo-Springfield road rollers and compaction equipment; C. S. Johnson batching plants and clamshell and concrete buckets; Kwik-Mix bituminous mixers, Moto-Bugs, and the Hi-Lifter and Ka-Mo earth rock-boring units.

Already a Parsons and Koehring Division distributor, Western Machinery now handles Koehring's complete construction-equipment line. The dealer has a branch at Odessa, Texas.

The Cornelius Co., 1510 Second St. N.W., Albuquerque, N. Mex., a distributor for the Parsons division, has added four counties in southwestern Colorado to its territory, which covers all but two counties in New Mexico. The dealer will handle the complete line of Parsons Trenchliners.

Fincham Equipment Co., 1033 W. Mississippi Ave., Denver, has been appointed a distributor by the Parsons division for its ladder and wheel-type trenchers in Wyoming and all but 4 counties in Colorado.

### B-L-H division names

The Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Lima, Ohio, has appointed Construction Equipment Co., Inc., Pittsford Road, Epsom, N. H., a distributor for



One of the twelve 5,500-ton sections of precast, reinforced concrete for the new vehicular tunnel under the Oakland Estuary between Alameda and Oakland, Calif., is under construction in this temporary drydock. Some 2,900 yards of concrete and 300 tons of reinforcing are required for each section of the 3,350-foot-long tube.



Topsoil is stripped by an International TD-25 on what will be one of 20 ramps in a new interchange for U. S. 1 and Massachusetts 128 in Essex County. Berke Moore Co., Boston, is the contractor on the job, which calls for 11 miles of ramps, 6 bridges, one tunnel, and modification of existing roads.

## Small CRAWLER-TRACTOR INCREASES PROFITS!

- Backfills ● Excavates.
- Grades ● Spreads.
- Drawbar 2000 Pounds.
- Size: 41" x 84".
- Lifts 7'3".



MEAD **SPEEDCAT**

- (1) Operates in tight places where other equipment cannot be used!
- (2) Delivers power and traction proportionate to larger crawlers!
- (3) Can be operated or loaded on a pick-up truck or trailer by one man!

Write for Literature or Demonstration

**SPEEDCAT TRACTOR DIVISION**

MEAD SPECIALTIES CO., DEPT. T-211, 4114 N. Knox Ave., Chicago 41, Ill.

For more facts, use Request Card at page 18 and circle No. 367

Lima Austin-Western crushing, and washing equipment in the state of New Hampshire.

Construction Equipment Co. also distributes Lima shovels, cranes, draglines, pullshovels, and the Lima Road-packer vibratory compactor.

Reid-Holcomb Co., Inc., 1815 Kentucky Ave., Indianapolis, Ind., has been named a distributor for Lima Austin-Western crushing, screening, and washing equipment in all but one county in Indiana. The company also handles Lima shovels, cranes, and draglines.

### Two new distributors for Midland Products

Midland Products Co., Mahwah, N. J., has two new distributors.

Fletcher Equipment & Supplies, Inc., 743 Camp St., New Orleans, La., is handling Midland contractors' pumps in the New Orleans area; and Casey & Emmert, Inc., 1424 W. Ohio St., Chicago 22, Ill., is handling the same equipment in the Chicago area.

## DURAFORM

NOW... a speed form  
**COMPLETELY REVERSIBLE FOR MORE PROFITS**

- ★ All panels are reversible for outside or inside walls.
- ★ No loose hardware to handle or lose.
- ★ One man can set a Duraform panel.
- ★ Plastic impregnated.
- ★ Duraforms combine framing and bracing in one unit.

For larger profits next season write today for complete information.

**DURAFORM, INC.**

Dept. E, 2903 W. Beltline Hwy., Madison, Wis.  
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MOBILE OFFICE Units are low in cost... Built to your specifications... There's a unit to fill your every need.

Because MOBILE OFFICE Units are easy to move from job to job, they enable you to have office, engineering, paymaster and other facilities at every point of your operation.

These units are economical, time saving, rugged and durable. They are self-contained, and are available with air-conditioning, and can be fitted to your specifications.

MOBILE OFFICES are being used by major contractors and other major businesses throughout the United States. In every case they have proven their worth.

Remember, whatever your needs may be, a MOBILE OFFICE Unit can be built to fill your requirements.

If It's Mobile... We Build It!

**MOBILE OFFICE, INC.**  
Phones: DORchester 3-1048-9

10 Stony Island Avenue, Chicago 49, Illinois

For more facts, use Request Card at page 18 and circle No. 369

SAFE • SPEEDY • DEPENDABLE

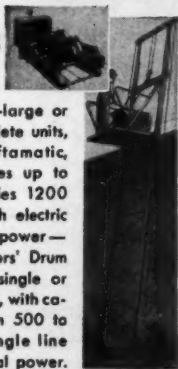
**Derricks** For every contractor's need —Stiff-Leg, Guy Line, Setter, A-Frame, Pole and Tripod, Roofers' Circle Swing Derricks... hand and/or power operated. Proved performers on every type of job. Safe and dependable.



"PROVED IN SERVICE"  
**Sasgen**

### Hoists

Made to fit your requirements—large or small. Complete units, like the Liftomatic, which reaches up to 90 ft., carries 1200 lb. load with electric or gasoline power—or Contractors' Drum Hoist Units, single or double drum, with capacities from 500 to 5500 lb. single line pull. Optional power.



### Winches

From U.L. approved safety scaffold winches to heavy-duty hand-powered winches that will take from 400 to 40,000 lb. loads, Sasgen has a complete line to handle your job quickly and safely. You can't buy a better winch!



Handled by Leading Equipment Distributors Everywhere  
WRITE FOR CATALOG AND PRICES

**Sasgen DERRICK COMPANY**

3127 W. GRAND AVE. • CHICAGO 22, ILLINOIS

For more facts, circle No. 370

CUT COLD WEATHER COSTLY DELAYS WITH



## KIM HOTSTART

Electric Pre-Heater for Diesel and Gasoline Engines

Equipment kept warm between operating periods, ready for instant action. Ideal for units with Torque Converters. KIM prevents cold weather damage; reduces wear and costly down-time. Plugs into electric circuit; draws off cold water from engine; heats and circulates it through engine. Approved and used by all major engine manufacturers.

SEE YOUR DEALER or write for free literature:



**KIM HOTSTART MANUFACTURING COMPANY**

West 917 Broadway Avenue, Spokane 1, Washington

For more facts, use Request Card at page 18 and circle No. 371

## Avoid legal pitfalls

### Valuation of land condemned by state

**THE PROBLEM:** The Commonwealth of Pennsylvania condemned parts of land used by a sand and gravel company in its production operations. Were the facts such that the company was entitled merely to the fair market value of the condemned land, as distinguished from loss of prospective profits in operation of the business?

**THE ANSWER:** Yes. (Sgarlat Estate v. Commonwealth of Pennsylvania, 156 Atl. 2d 541, decided by the Penn-

sylvania Supreme Court.)

Incidentally, the court ruled that where two parcels of land, separated by three miles or more, were used in connection with the sand and gravel business, and where sand and gravel obtained on one of them was processed in the second, which could be used for other purposes, and either parcel could go on functioning without the other, they could not be considered as a unit for condemnation purposes.

### Highway contractor sues over delay

**THE PROBLEM:** A state highway contract obligated the state highway department to clear the right-of-way of public-utility installations before notifying the contractor to begin work, which was to be started and finished by specified dates. The work was delayed because the utility companies did not remove their installations. The contractor sued the department for not promptly providing a clear right-of-way and the utility companies for the delay. (1) Was the department liable? (2) Were the utility companies liable?

**THE ANSWERS:** (1) Yes. (2) No. (Derby Road Building Co. v. Com-

monwealth of Kentucky, 317 S.W. 2d 891, decided by the Kentucky Court of Appeals.)

The court said that the state was liable because the department had expressly obligated itself to clear the right-of-way of utility installations before giving notice to begin work. Since a state cannot be sued for breach of an implied obligation, it was important that the department had expressly contracted to furnish a clear right-of-way.

The utility companies were not liable because they were under no contractual obligation to the contractor. Had the companies' delay in removing the installations been due to malice or disregard for the contractor's rights, it was intimated they might have been liable. In this case

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### Licensing ordinance upheld by state

**THE PROBLEM:** A village ordinance prohibited anyone from working as a carpenter contractor without getting a license from, and furnishing a bond to, the village. A nonresident was doing carpentry work in the village for a general contractor under a written contract that provided for labor only. He had neither obtained a license nor furnished a bond. Was the ordinance illegal and void on the grounds that (1) it was a revenue measure only, without accompanying regulatory provisions; (2) it was beyond the express or implied authority granted to the municipality by the legislature; and (3) it tried to exercise extra-territorial jurisdiction over non-residents?

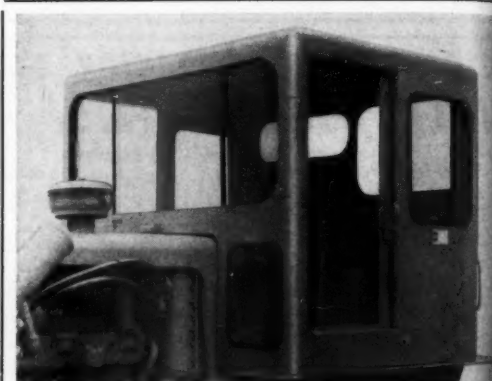
**THE ANSWER:** No. (Village of Maywood v. Weglarz, 165 N.E. 2d 362, decided by the Illinois Appellate Court, First District.)

### Measuring job damage to adjacent property

**THE PROBLEM:** A grading contractor was sued by the owner of a home adjacent to the job site for damage resulting from dust created by the contractor's dumping loose dirt from a height of 50 or 60 feet. The trial judge allowed the home owner damages based upon the difference in the value of his property before and after it was damaged by the dust. Did the judge err in measuring the damages collectible?

**THE ANSWER:** Yes. (Plonely v. Reser, 3 Cal. Rptr. 551, decided by the California Superior Court, Los Angeles County, Appellate Department.)

The court, in ordering a new trial, decided that in cases like this the sum allowable is the difference in the fair market value of the property immediately before and after the injury; but that if the injury has been repaired, or is capable of repair, so as to restore the fair market value as it existed immediately before the injury, at an expense less than such difference in value, then the measure of damage is the expense of such repair rather than such difference in value.



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CONTRACTORS AND ENGINEERS

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the contractor could not complain because the delay appeared to have resulted from a dispute between the department and the companies as to who should pay for the relocation of the installations.

### Retention of checks conditionally tendered

**THE PROBLEM:** Depending upon the facts of a particular case, a creditor's retention of the debtor's check, tendered as covering a balance due, may constitute a final settlement—known in law as an "accord and satisfaction." A dispute existed under a subcontract as to whether the subcontractor was bound to make certain installations, and the prime contractor sent the subcontractor a check

for an amount less than was claimed. Did the subcontractor's retention of the check release his claim for a larger sum?

**THE ANSWER:** No. (Hoepfner Construction Co. v. United States, 273 Fed. 2d 835, decided by the United States Court of Appeals, Tenth Circuit, upholding a similar decision by the United States District Court for the District of Colorado.)

The Court of Appeals reasoned that the subcontractor, promptly on receipt of the check and the accompanying letter, wrote the prime contractor that the check would not be accepted in full settlement of the claim but would be applied on the account, unless the prime contractor objected to such application. The prime contractor did not respond to

### Edited by A. L. H. STREET Attorney-at-Law

*These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.*

that letter. Not only was there notice of nonacceptance and nonassent, but later the subcontractor unsuccessfully attempted to return the check by mailing it to the contractor's last-known address, from which it was returned.

### Unauthorized substitution of brand equipment

**THE PROBLEM:** A contract to drill a 28-inch irrigation well to water expected at 80 feet required installation of a screen and a turbine pump of specified makes "to produce 1,000 gpm." A screen and pump of other brands were substituted without consent of the owner. The well did not produce 1,000 gpm. Was the contractor entitled to collect the contract price for the work and materials furnished?

**THE ANSWER:** No. (B. F. Edington Drilling Co., Inc. v. Yearwood, 118 So. 2d 419, decided by the Louisiana Supreme Court.)

The court ruled that the contract was ambiguous as to whether the contractor guaranteed that the pump furnished would be capable of pumping that quantity. Since the contract was worded by the contractor, it must be read in the light most favorable to the owner—as meaning a guarantee of water production and not of pump capacity.

The contractor was further prevented from collecting the contract

price because of the substitution of different brands of screen and pump. It was immaterial that the pump installed pumped all the water the well produced.

Nor was the contractor entitled to collect 65 per cent of the contract price because the well produced 650 gpm.

### Architect's decision found to be binding

**THE PROBLEM:** A contractor contracted with a county school district to grade grounds as part of a high school building project. On completion of the work, he sued a county board of education—which was the school district board's successor—for pay. Was the county board bound by

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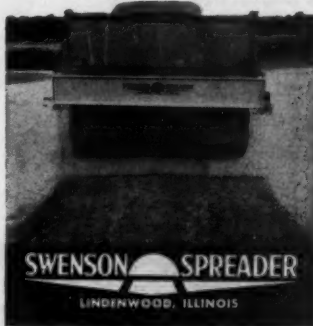
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ND ENGINE

## avoid legal pitfalls

(Continued from preceding page)

the supervising architect's decision as to the quantity of rock that plaintiff contractor had removed?

**THE ANSWER:** Yes. (Hines v. Farr, 112 S. E. 2d 33, decided by the South Carolina Supreme Court.)

The contractor and the school district board had agreed that the architect, who was agent of the district board, was to make final inspection of work, and that he should issue final certificate stating that work had been completed and accepted by him and that the entire balance found to be due the contractor would be due and payable. It was

also provided that it was the responsibility of the architect to make written decisions in regard to all claims of owner or contractor, and the decision of the architect was conclusive. Therefore, the court decided, the county board of education was bound by the architect's determination as to the amount due for rock excavation, in absence of proof of fraud, incompetency, or other gross mistake on the architect's part that would imply bad faith or dishonesty.

### Bid irregularities

**THE PROBLEM:** The lowest bidder for a municipal contract failed to have certified the check deposited with his bid as required by the bidding specifications, but he did have it certified after being awarded the contract. The governing statute permitted the municipality to require the deposit but did not make a deposit mandatory. Was the award valid?

**THE ANSWER:** Yes. (P. Mitchelotti & Sons, Inc. v. Borough of Fair Lawn, 152 Atl. 2d 369, decided by the New Jersey Supreme Court, Appellate Division.)

The court reasoned that the bidding statute was intended to secure competition and to guard against favoritism, improvidence, extravagance, and corruption, for the bene-

fit of the public and not the bidders.

The statute does not require a municipality to demand that a deposit accompany a bid, but it may exact some form of security as a guarantee that the contract will be entered into if the bid is accepted.

Since the statute is intended to insure award of the work to the lowest responsible bidder, mere irregularities in the form of the bid do not justify its rejection, if there is substantial compliance with the requirements of the bidding specifications.

The waiver in this case in no way affected fair and competitive bidding. This was not a case of "material departure," "substantial variance," or "substantial noncompliance," which would block a valid contract and which the borough could not waive.

### Subcontractor liable for delay in paving

**THE PROBLEM:** A prime contract required the paving of streets in a housing development to be completed within 60 working days after September 12, and payment of \$50 a day to be made for delay thereafter. Performance was held up by a subcontractor's delay in completing other work that had to be done before paving could begin, and subsequent rainfall prevented the prime con-

tractor from completing the paving within the 60-day limit. The rainfall was somewhat heavier than usual. Was the subcontractor bound to reimburse the general contractor for his liability to the owner because of the delay in paving?

**THE ANSWER:** Yes. (Ely v. Bottini, 3 Cal. Rptr. 756, decided by the California District Court of Appeal, First District, Second Division.)

The court noted that statistics of rainfall in the area for 81 years were introduced in evidence from which the court found by comparison that this quantity of rainfall, while perhaps not commonplace, was not greater than had been measured in other years over a like period. A rainstorm somewhat greater than usual is not "totally unforeseeable."

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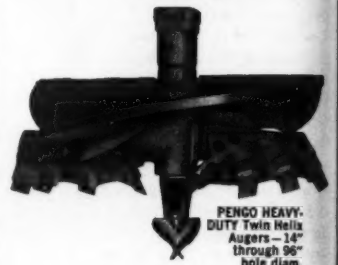
150'x30" Stacker shown includes electric power lift and electric power travel for finger-tip control of stacker discharge position.



100'x24" Stacker in the background stockpiles sand produced with an 8'x48" double-deck vibrating screen on a Model 101 Kolman Portable Conveyor-Screen Plant.

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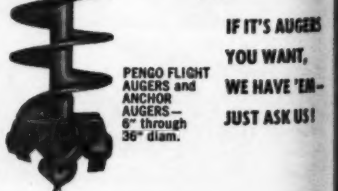


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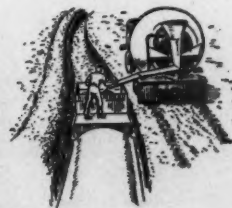
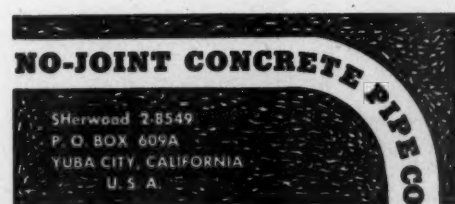
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## ASSOCIATED WITH

Morrison-Knudsen Co.  
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## Manufacturer Memos



Norman B. Obbard, new executive vice president, international, for U. S. Steel Corp.

Norman B. Obbard has been named executive vice president, international, of the U. S. Steel Corp., Pittsburgh, Pa.

Obbard, who joined the American Bridge Division of U. S. Steel in 1926 as an engineer in the tower department, became president of the division in 1954. Two years later, he was named assistant executive vice president, operations, of the parent corporation. For the past three years, he has been administrative vice president, production.

Loring S. Brock has been made president of the company's Products Division.

Brock has been executive vice president of the division since March. He succeeds John Hauerwaas, who has retired.

Austin J. Paddock has been appointed administrative vice president of fabrication and manufacture.

Paddock, formerly president of the

American Bridge Division, will be in charge of the American Bridge, Consolidated Western Steel, Universal Atlas Cement, and U. S. Steel Homes divisions.

J. Donald Rollins has been appointed president, American Bridge Division, U. S. Steel Corp.

Rollins was vice president of engineering for American Bridge from 1955 to 1958, when he became vice president of facility planning for the parent corporation. In March, 1960, he was made vice president of facility planning and appropriations, the post he held until his recent appointment.

The Armco International Corp., part of Armco Steel Corp., Middletown, Ohio, has named W. R. Young

vice president of C. A. Armco Venezuela with headquarters in Caracas, Venezuela.

Young was formerly general manager of Armco International's operations in Cuba.

The Yale & Towne Mfg. Co., New York, N. Y., has elected Harold Valentine to the newly created position of vice president—international.

He will be responsible for directing coordination, and promotion of Yale & Towne's activities in markets outside the United States and Canada.

A. Clifford Thornton was recently elected to the newly created position of vice president of personnel by the company.

Thornton will coordinate and administer personnel and industrial relations policies from headquarters executive offices in New York City.

Several new appointments have been made in the truck-sales department of International Harvester Co., Chicago, Ill.

Duane F. Kuntz, formerly assistant manager of sales, has been named divisional sales manager. He will be in charge of all International truck-sales activities. John C. Balleit, formerly assistant manager of sales, is the new manager of sales administrative services, while Russell C. Burns, previously general supervisor of fleet and manufacturers' accounts, has been named manager of motor-truck sales. J. Frank Adams is manager of parts and service sales.

Midland Products Co., Mahwah, N. J., has appointed J. Q. Rafferty to the newly created post of eastern regional manager. His background includes nearly 20 years in the sales and engineering field.

Several new appointments have been made in the microwave department of the Radio Corp. of America, New York, N. Y.

Walter C. Byrne, Jr., has been named manager for microwave marketing.

Haddon S. Wilson has been appointed custom microwave program manager. He is currently concerned with construction of a coast-to-coast Western Union microwave system, designed and produced by RCA.

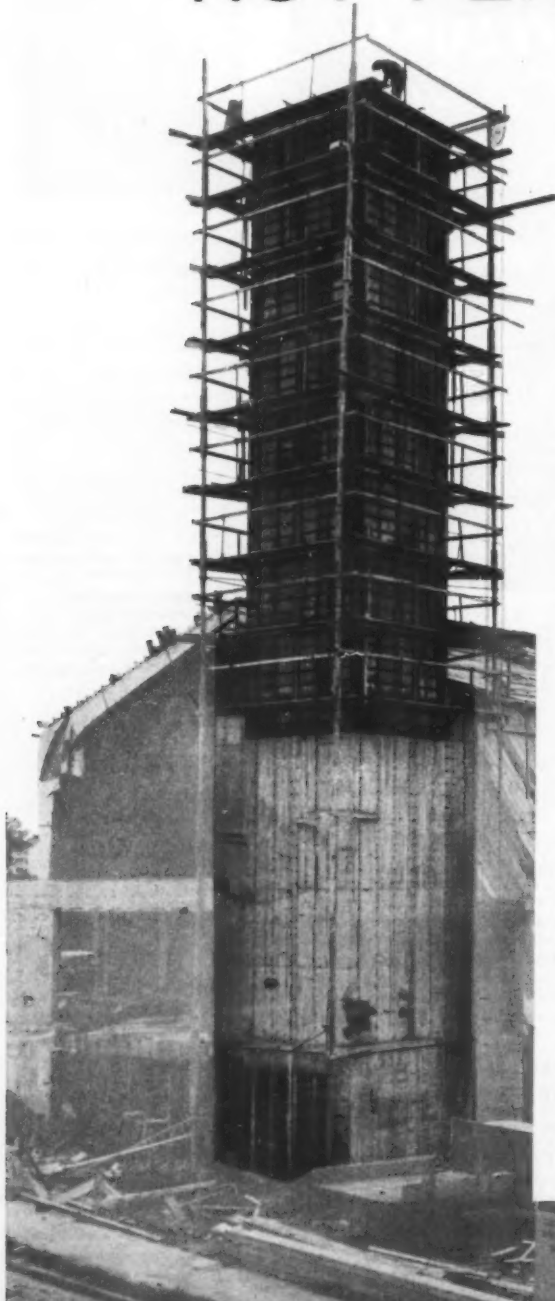
Norman E. Edwards is the new manager of microwave engineering. He is responsible for the design of RCA's high-capacity microwave equipment to be used in the Western Union system.

The three men will report to Edward J. Hart, who is now manager of the microwave department.

The Gorman-Rupp Co., pump manufacturer of Mansfield, Ohio, has appointed J. Kenneth Sloan as district representative, covering the midwestern states.

Sloan takes over the territory of William S. Miller, who has been named sales manager of Gorman-Rupp of Canada, Ltd., St. Thomas, Ont.

## NOT PERFECT—but



When Rudy Nordenburg, Superintendent of the N. D. MacDonald Co., general contractors of the Sacred Heart Church in Seattle, Washington, began forming the 85 ft. high bell tower with UNI-FORM Panels, he expected to maintain vertical accuracy.

On completion of the pour, a check indicated that the top of the tower was  $\frac{1}{8}$ " off plumb—less than .00166" per foot! Rudy and his forming crew couldn't have come closer or been more accurate if they had turned the tower on a giant lathe!

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